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ANNUAL SANITARY REPORT

OF THE

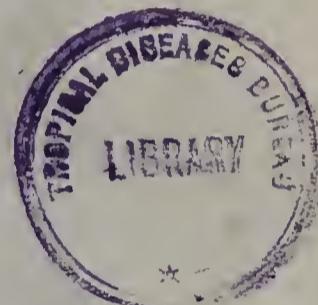
PROVINCE OF ASSAM

FOR THE YEAR

1917.

BY

MAJOR T. C. McCÓMBIE YOUNG, M.D., D.P.H., I M.S.,
SANITARY COMMISSIONER, ASSAM.



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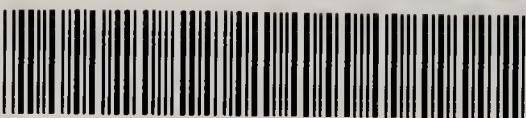
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FROM

MAJOR T. C. McCOMBIE YOUNG, M.D., D.P.H., I.M.S.,
SANITARY COMMISSIONER, ASSAM,

To

THE SECOND SECRETARY TO THE CHIEF
COMMISSIONER OF ASSAM.

Dated Shillong, the 8th May 1918.

SIR,

I HAVE the honour to submit herewith the Annual Sanitary Report of the Province of Assam for the year 1917.

I have the honour to be,

SIR,

Your most obedient Servant,

T. C. McCOMBIE YOUNG, Major, I.M.S.,
Sanitary Commissioner, Assam.

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1917

[Maximum limit of narrative portion of report, 30 pages.]

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ANNUAL SANITARY REPORT

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PROVINCE OF ASSAM

FOR THE YEAR

1917.

SECTION I.

METEOROLOGY.

The following brief summary of the meteorological conditions in Assam for the year 1917 has been furnished by the Director General of Observatories :—

"*The cold-weather period, January and February.*—Rainfall in the plains was in defect by 39 per cent. in January and in excess by $2\frac{1}{2}$ or 198 per cent. in February. There was considerably more cloud than is usual in the season, but temperature was nearly normal. Humidity for the period was appreciably above normal at Shillong and Cherrapunji and about the average in the plains.

"*The hot weather period, March to May.*—Rainfall in the plains was short of the normal by 67 per cent. in March, 22 per cent. in April and 40 per cent. in May. Skies were unusually clear in the plains and clouded to more than the customary extent in the hills. Humidity tended to be low in places.

"*The south-west monsoon period, June to September.*—Rainfall in the plains was somewhat heavier than usual in June and September, about the average in July and in slight defect in August.

"The combined fall of the four months was very nearly normal, being in excess only by 2 per cent; there was however an appreciable excess in the Upper Brahmaputra Valley. The quantity of cloud was either normal or in excess except at Dhubri and Dibrugarh, while humidity and temperature agreed closely with the average.

"*The retreating south-west monsoon period, October to December.*—In October rainfall occurred chiefly during the first nine days and was 39 per cent. in excess of the month's normal in the plains. In November the only days on which widespread rain was reported were the first and second, but the month's total fall was 50 per cent. above normal. December, on the other hand, was somewhat drier than usual. The cloud proportion was decidedly high at Sibsagar, Shillong and Cherrapunji and low at Dibrugarh and Tezpur. Humidity and temperature presented no marked abnormal features."

Common rice was sold at an average price of 9 seers per rupee in the plains districts and was unusually cheap in the months of November and December.
Price of food-grains and their connection with vital occurrences.

The meteorological conditions do not appear to have adversely affected the public health during the year. There were no heavy floods during the year except in the district of Darrang, which is reported to have in places experienced interrupted communications for a time, but the public health does not seem to have been affected thereby.

SECTION II.

EUROPEAN ARMY.

(No remarks.)

SECTION III.

NATIVE ARMY..

(No remarks.)

SECTION IV.

JAILS.

(No remarks.)

SECTION V.

GENERAL POPULATION.

Vital Statistics.

2. The population of the province according to the census of 1911 including that

General census figures. Provincial birth and death rates. Comparison with other provinces. of the Manipur State was 7,059,857 and, as in previous years, the ratios in this report are calculated on the population of the plains districts which is 6,051,507.

There is no system of registration in Manipur State, and it is only partially carried out in other hill districts, in which the total population under registration is 194,823. The result of registration in hill districts is shown separately in paragraph 10 of this report.

The birth-rate for the year was 31·35 and is compared below with the rates recorded in other provinces in India :—

Provinces.	Birth-rate.		
	1911-1915.	1916.	1917.
1	2	3	4
Assam ...	32·75	30·52	31·35
Bengal ...	33·93	31·89	35·91
Bihar and Orissa ...	42·8	36·6	40·4
Central Provinces ...	49·26	43·85	48·13
Madras ...	31·6	32·54	32·37
Burma ...	33·58	33·71	36·25
Bombay ...	36·09	35·98	35·72
United Provinces ...	45·06	43·09	46·08
Punjab ...	44·9	45·59	45·3
North-West Frontier Province ...	34·53	33·84	32·11

The death-rate for the year was 27·09 and is compared below with the rates recorded in other provinces in India :—

Provinces.	Death-rate.		
	1911-1915.	1916.	1917.
1	2	3	4
Assam ...	26·37	28·59	27·09
Bengal ...	30·10	27·37	26·19
Bihar and Orissa ...	31·1	32·8	35·2
Central Provinces ...	35·98	39·95	36·06
Madras ...	23·2	21·87	26·23
Burma ...	25·84	23·97	25·30
Bombay ...	29·09	33·32	40·76
United Provinces ...	34·64	29·50	37·91
Punjab ...	31·7	30·7	37·9
North-West Frontier Province ...	24·15	30·09	29·95

3. The total number of births registered during the year 1917 was 189,741 against 184,739 in the preceding year, the birth-rates being 31·35 Birth registration—General. and 30·52 respectively, and the quinquennial average 32·46. The fall in the birth-rate, which is lower by 1·11 per mille than the average of the quinquennium, is chiefly due to the low rate recorded in the district of Sylhet, which suffered considerably from floods, and an epidemic of cholera in 1915, the result of which is probably felt in the year under review. No widespread epidemics have been reported from this district during the year to account otherwise for the decrease.

As compared with the quinquennial average, the largest increase (+4·11) was reported from Nowgong, the next highest being in Goalpara (+2·36). Other districts reporting increased birth-rates are Lakhimpur (+1·48) and Darrang (+·56).

The natural increase of population during the year, i.e., the increase of births over deaths, was 4·26 per mille, as compared with 1·93 in 1916. This increase has been shared by all districts except Kamrup, in which district the health was not as good as in other districts owing to the prevalence of cholera. The year would therefore appear to have been a comparatively healthy one, and the amount of the natural increase is satisfactory, although less than that of the prolific populations of Bengal, United Provinces and Central Provinces.

4. The birth-rate of the 20 towns of the province in which registration is compulsory, was 30·23 as compared with 27·31 in 1916 and 29·77 in 1915. The average ratio of the last five years was 27·78.

Rates above the urban average of 30·23 were recorded in Barpeta (45·44) which as usual heads the list, followed by Nowgong (43·07). Nowgong was formerly considered an unhealthy town and its high birth-rate may be taken as evidence of the value of the increased attention that has of late years been given to municipal sanitation. Other towns recording increased birth-rates are North Lakhimpur (34·04), Golaghat (33·54), Tezpur (32·67), Goalpara (31·69), Gauhati (31·32) and Dhubri (30·64). Rates below 30 per mille have been recorded in the towns of Sylhet (26·49), Silchar (26·40), Dibrugarh (26·36) and Jorhat (24·27). I am not satisfied that the figures for Sylhet and Jorhat represent the true state of matters, for in Sylhet registration is not as good as it should be, and Jorhat was for some time without the services of the Sanitary Inspector, who is also registrar of births and deaths. The ratio for Dibrugarh being calculated on the census population is fallacious, as the population of the town has decreased, and an investigation has shown that 14·6 per cent. of births escaped registration in this town. The registration in Hailakandi, Sunamganj and Karimganj on which I commented adversely in my previous reports appears to have improved somewhat, partly on account of the check exercised by verifications carried out by the vaccination inspecting staff.

5. The total number of births registered in rural areas during the year under report was 186,130 which yields a ratio of 31·37 per mille Birth registration in rural areas. of population against 181,477 and 30·59, respectively, in 1916.

Taking registering circles individually, the highest rate of 282·35 per mille was reported by Chirang circle in Goalpara district. As the population of this registration circle is stated to be only 255, this abnormal rate need not be discussed further than to remark that the occurrence of 72 births among a population of 255 seems unlikely, and it suggests that the population of this circle is considerably in excess of that assigned to it. Rates above 45 per 1,000 were recorded in the four circles of Sidli, Bijni-Duar, forest villages and Ripu circles in Goalpara, Nowgong circle of Nowgong, Raha and Nalbari circles of Kamrup and Paneri circle of Darrang. In these Goalpara and Nowgong circles it is probable that immigration has increased the population since the census and has disturbed the ratio to some extent. Six circles of Goalpara and one circle each of Sylhet, Darrang and Sibsagar reported rates between 40 and 45 per mille. Rates below 20 per mille was reported by Doom Dooma circle (9·83) in Lakhimpur, Lumding circle (13·52) in Nowgong, Palashbari circle (19·19) and Rangia circle (19·46) in Kamrup, and Sonari circle (19·54) in Sibsagar. I have commented on the defective registration in these circles in previous reports and no effective remedial action is at present possible, owing to the want of a staff to carry out special investigations. In regard to Nowgong and Kamrup the attention of the Civil Surgeons concerned was drawn to the defective registration in Lumding and Palashbari circles and frequent inspections of the Gaonbara's registers in these circles by the vaccination inspecting staff were urged. Some improvement took place in 1914 and 1915 as the result of such action, but these circles seem to have relapsed to their former condition.

6. In 1917, 163,925 deaths were registered as compared with 173,038 in 1916, showing a decrease of 9,113. The death-rate for the year Death registration—general. was 27·09 as against 28·59 for the preceding year and 27·36, the quinquennial average.

When compared with the rate of the preceding year (1916), the death-rate for the year 1917 was higher in the districts of Kamrup and Cachar, and lower in all other districts. The increase of 6·16 per mille in Kamrup is presumably due to an outbreak of cholera in some parts of the district in March to July.

As compared with the quinquennial average, there was an increase in three districts (Kamrup, Lakhimpur and Cachar) and a decrease in four.

7. The total number of deaths registered in twenty towns during the year 1917 was 2,622 against 2,918 in 1916, representing annual ratios Death registration in urban areas. 21·95 and 24·43 per mille, respectively, against the quinquennial average of 24·03 per mille.

The highest rates were recorded in Mangaldai (84·09), North Lakhimpur (33·43) and Golaghat (32·20). These three towns are Unions in which a very low standard of sanitation is maintained, and as taxation is low, no effective conservancy system is maintained. The mortality in Mangaldai is reported to be due to cholera, fevers,

dysentery and diarrhoea. A well has been provided in this town during the year and a tank has been improved. The population of this town is very small, *viz.*, 654. The high mortality in North Lakhimpur is attributed to fevers, dysentery and diarrhoea. The improvement of the water-supply in the town of Golaghat has of late been effected at a considerable expense by means of protected tanks, and its water-supply is by no means bad. It is probable that its high mortality from diseases such as cholera is due to the rudimentary state of its conservancy system and the small amount of attention given to general sanitation. Rates of 20 per mille or less were recorded in 7 towns, *viz.*, Silchar (19·46), Dhubri (19·11), Hailakandi (17·78), Jorhat (17·01), Habiganj (16·65), Sibsagar (15·96) and Karimganj (15·07), during the year under report as against 4 in the preceding year. As compared with the rates of 1916, there was an increase in nine towns and a decrease in eleven, and compared with the quinquennial average there was an increase in 10 and a decrease in 10.

The urban figures are not comparable with those of the rural population, as the age and sex composition of the population is different, and the variation in population since the census, and the increased accuracy in registration, make it impossible to show the improvement of the health of the urban population which has undoubtedly resulted from the increased attention given to urban sanitation in the last few years.

8. The death-rate in rural areas was 27·19 in 1917 as compared with 28·68 in 1916 and an average of 27·43 in the last five years. The

Death registration in rural areas. highest death-rates of 50 per mille and above were reported

in Raha (64·22), Nalbari (51·26) and Bajali (50·49) circles in Kamrup district due to cholera, Paneri circle (55·88) in Darrang due to *kala-azar*, and Guma (55·34) and 3rd Sidli circle (53·34) in Goalpara due to fevers. As already pointed out, the figures for these Goalpara circles are probably inflated by immigration. The death-rates in the following circles also appear high—Kanairghat circle (49·89) in Syhet, Nowgong circle (49·68) in Nowgong, Kalaigaon (47·45) and Mangaldai (42·49) circles in Darrang, and Bijni Duar (46·78), Forest village (42·85) and Lakhipur (42·75) in Goalpara. Cholera, small-pox and fever contributed to the high death-rates in Kanairghat; fever, *kala-azar*, dysentery and diarrhoea produced the high rate in Nowgong; cholera is the cause of high rates in Kalaigaon, Mangaldai and Bijni, Kalaigaon suffering from *kala-azar* in addition. Fever was the main cause of the high rates in the Forest village and Lakhipur circles. Rates below 20 per 1,000 were reported from Rangia (19·68) in Kamrup, Raha (17·68) in Nowgong, Dharampassa (17·40) and Derai (17·00) in Sylhet, Sonari (14·79) in Sibsagar, Gohpur (13·74) in Darrang, Palashbari (13·57) in Kamrup, Lumding (9·56) in Nowgong, and Doom Dooma (9·55) in Lakhimpur.

9. The subjoined table shows the defect in registration of vital statistics in compulsory urban areas, as discovered by the vaccination inspecting staff during the year 1917:—

*Registration in compulsory areas.
Prosecutions under Act IV (B.C.)
of 1873.*

Municipalities.	Unregistered vital occurrences detected during 12 months from October 1916 to September 1917.		Recorded vital occurrences during 12 months from October 1916 to September 1917.		Percentage of omissions.			
	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.		
1	2	3	4	5	6	7		
Silchar	7	4	109	66	6·03	5·71
Hailakandi	3	35	30	...	9·09
Sylhet	15	4	361	376	3·99	1·05
Karimganj	5	2	65	58	7·14	3·33
Maulvi Bazar	8	3	67	20	10·67	13·04
Habiganj	16	5	131	112	10·88	4·27
Sunamganj	23	7	82	46	21·90	13·21
Dhubri	12	7	166	91	6·74	7·14
Goalpara	1	1	201	146	·49	·68
Gauhati	68	21	719	622	8·64	3·27
	Carried over ...		155	57	1,936	1,567	...	...

Municipalities.	Unregistered vital occurrences detected during 12 months from October 1916 to September 1917.		Recorded vital occurrences during 12 months from October 1916 to September 1917.		Percentage of omissions.	
	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
1	2	3	4	5	6	7
Brought forward	... 155	57	1,936	1,567	...	...
Bairpeta ...	24	2	482	278	4·74	.71
Tezpur ...	5	4	110	56	4·35	6·67
Mangaldai ...	1	6	25	25	3·85	19·35
Nowgong ...	19	3	204	116	8·52	2·52
Sibsagar ...	6	2	140	99	4·11	1·98
Nazira ...	...	2	81	67	...	2·90
Jorhat ...	6	3	138	90	4·17	3·23
Golaghat ...	...	1	76	75	...	1·32
Dibrugarh...	42	9	245	102	14·63	8·11
North Lakhimpur ...	...	...	35	29	...	...
Shillong ...	43	2	426	259	9·17	.77
Total ...	301	91	3,898	2,763	7·17	3·19

In the subdivisional towns of the Sylhet district more attention has been paid to the detection of omissions, and the number so found indicates the need for the continuance of this activity.

Within certain limits, the number of omissions discovered is an index of the activity of the inspecting staff.

Four hundred and twenty-two persons were prosecuted and 333 persons were convicted and fined to the extent of Rs. 503·9, as against 255 convictions last year. It is satisfactory to note that the amount of the fines is increasing, the average fine per head being approximately Rs. 2 as compared with the inadequate fines of annas 4 and annas 8, of which complaint has frequently been made in previous reports.

10. The subjoined table shows the recorded birth and death rates in the hill districts and in the North-East Frontier in 1917 compared with those of the preceding year :—

Districts.	1917.		1916.	
	Birth-rate.	Death-rate.	Birth-rate.	Death-rate.
1	2	3	4	5
Khasi and Jaintia Hills ...	28·02	24·36	24·12	23·40
Naga Hills ...	16·77	19·60	18·73	33·11
Lushai Hills ...	40·76	31·75	41·68	29·86
Garo Hills ...	27·96	21·11	22·72	19·86
North-East Frontier ...	...	Not available.		

The continued fall in the birth-rate of the Naga Hills and the continued lack of natural increase attracts attention, but as these figures refer only to the Dimapur circle which is sparsely populated, and to the town of Kohima, they are no real indication of the health of the population in general.

Cholera was responsible for 47 deaths in the Khasi and Jaintia Hills district, none occurring in the preceding year, and in this outbreak all three rural registration circles of Shillong, Jowai, and Cherra suffered. In Jowai cholera broke out in May, and in Shillong and Cherra in July, the disease being imported from the plains. The birth

and death rates of the Shillong Municipality were 33.21 and 20.82, respectively, in 1917, compared with 26.24 and 15.54, respectively, in 1916. The increase in the death-rate is due to diseases grouped under "all other causes" and "fevers." Two disease epidemics occurred in the town; the first was an outbreak of typhoid among the Khasi population of Mawkhari and Jaiaw which occurred during the early months of the hot weather. This was in all probability due to the deficient water-supply of these areas and to defects in the conservancy system, particularly the insanitary state of house privies. The water-supply was supplemented by an additional pipe line and steps were taken to improve the condition of the privies. The Civil Surgeon, Dr. Gordon Roberts, and the Director of the Pasteur Institute, Captain Knowles, I.M.S., carried out a large number of inoculations among the Khasi population with typhoid vaccine prepared at the Pasteur Institute, 1,760 persons being inoculated. This is believed to be the first known instance of an Indian population voluntarily submitting to inoculation with typhoid vaccine on a large scale, and the thanks of Government were appropriately expressed to these officers for this valuable work. In the latter part of the hot weather an outbreak of diphtheria occurred in a boarding school in Shillong. The origin of the epidemic was obscure, but it was probably imported by two children from Calcutta who were attending the school as day scholars, who suffered from mild typical attacks of what subsequent events suggest to have been diphtheria. Fortunately the true nature of the outbreak was recognised by the Civil Surgeon, Dr. Roberts, as soon as it was brought to his notice, and as the health of the large European child population of this hill station during a crowded season was felt to be at risk, with the co-operation of the Officiating Civil Surgeon, Captain Green Armytage, I.M.S., stringent measures of isolation were put in force, and the examination of throat swabs for the detection of suspected cases, and contact carriers was carried out. For these numerous bacteriological examinations, we were indebted to Captain Knowles, I.M.S., Director of the Pasteur Institute, without whose assistance scientific control of the epidemic would have been impossible.

The dispensary returns of the Lushai Hills show that the year under report was not healthy. During the year 1917 there were no epidemics of cholera and small-pox, but dysentery was prevalent to a large extent. Fever, especially malaria, was reported to be more prevalent than in the preceding year. The registration in the Lushai Hills is carried out throughout the district, and as it is believed to be fairly accurate, the facts regarding the health of the district as shown by the birth and death rates may be taken as approximately correct. Small-pox, dysentery and respiratory diseases contributed to the increase in the death-rate in Garo Hills in 1917 as compared with the preceding year. The Civil Surgeon considers that fever is not now as prevalent in the Garo Hills as it used to be, owing to the use of quinine as a prophylactic, the total number of cases of malaria treated in the dispensaries in 1917 being 4,577 against 5,171 in 1916.

An outbreak of malaria occurred at Pasighat in the North-East Frontier district and the cause of the prevalence of this disease is being investigated by the Sanitary Commissioner.

11. The subjoined table shows the birth and death rates reported from tea estates Registration in tea gardens. during the year 1917, calculated on the census population of 1911 :—

District.	1	Birth-rate.	Death-rate.
		2	3
Cachar	23.48	19.68
Sylhet	29.12	22.87
Goalpara	42.47	63.71
Kamrup	21.68	21.75
Darrang	32.41	34.83
Nowrang	29.55	29.50
Sibsagar	35.99	34.86
Lakhimpur	...	33.85	33.25
Total	31.10	30.41

From these figures it appears that the efforts which have been made to secure more accurate information regarding the vital occurrences on tea estates have borne

fruit. The figures for the Assam Valley districts approximate to the provincial and district totals, but are not yet sufficiently reliable to justify detailed examination, as in some districts returns are amissing. The Surma Valley districts also show an improvement, but in Cachar the difference between the ratios given and the general district returns suggests that more attention to regular reporting is required in that district. Last year the recorded birth-rate for all tea estates was 25·15 and the recorded death-rate 30·96, while for the year under review the recorded birth-rate is 31·10 and the recorded death-rate is 30·41. As was suggested when this question was first raised, it now appears that the apparent excess of deaths over births on tea estates was an unmerited slur on the health conditions under which the labour force of the tea industry lives, due to defective reporting, and the attention of the tea industry may perhaps be directed to the obvious inference arising from a scrutiny of these figures, that it is to its advantage to render regular and accurate returns of the births and deaths occurring on tea estates.

The number of deaths from *kala-azar* on tea estates rose from 60 in 1916 to 206 in 1917, nearly half of these (101) being reported from the infected tea estate of Duria in Sibsagar.

Nowgong with two infected tea estates reports 51 and Lakhimpur reports 1. The question of *kala-azar* in general is dealt with in paragraph 25 of this report.

12. The total number of births and deaths registered within railway limits during Registration on railways. the year 1917 were 53 and 293, respectively, as compared with 75 and 296, respectively, in 1916.

13. As in the previous year, the birth-rate per mille was 3 in the months of January, October, November and December and in the remaining months it was 2, except in June, in which month the lowest rate of 1·8 was recorded. Seasonal incidence of births and deaths.

There was no deviation in seasonal mortality from that of the year 1916. The rate of mortality was 1·82 and 1·91 per mille in the months of February and March, respectively, and in the remaining months it was between 2 and 3 per mille.

14. The rate of mortality among male infants was 182·73 and among female infants 154·19 per mille, as compared with the corresponding rates of 190·69 and 159·40 of the preceding year. Mortality according to age, sex and class. As usual the rate of mortality was the highest in the first

year of life and lowest in the age group 10-15. The rate of infant mortality, calculated on the number of births registered, was 189·28 per mille in 1917 as compared with 202·00 in 1916 and 201·89 in 1915. The death-rates among males and females of all ages during the year were 27·70 and 26·42, respectively, as compared with 29·28 and 27·85, respectively, in 1916.

The ratio of mortality was distributed among the different classes of the community in the following proportions :—

Christians ...	...	...	...	...	...	21·34
Hindus ...	...	...	...	...	...	25·31
Muhammadans	...	...	...	...	...	27·49
Buddhists ...	...	...	...	...	...	15·76
Other classes	...	...	...	...	...	37·59

15. During the course of their tours the subordinate vaccination inspecting staff checked 37,152 entries of births and 25,986 entries of deaths in 4,933 villages. The omissions found were 2·9 per cent. against 2·81 in 1916. The percentage of omissions detected varies from 7·7 in Darrang to 8 in Lakhimpur. Inspection of village registers of vital statistics.

The number of verifications done in Sibsagar district is very small, and is partly due to changes in the staff. The Civil Surgeon will be asked to give orders to ensure greater activity during the coming year. A list of gaonburas in whose circles omissions are detected is furnished to the Deputy Commissioner annually and this branch of their work is taken into consideration in granting rewards for their general efficiency.

16. There was no change in the agency for the collection and registration of vital

General accuracy of vital statistics and improvement effected during the year. statistics either in urban or in rural areas.

In the rural areas of Sylhet, Cachar and Goalpara, vital statistics were collected by police chaukidars and in Kamrup, Darrang, Nowgong, Sibsagar and Lakhimpur by gaonburas. The former report to thana officers and the latter, including also the

chaukidars of the *khos mahals* in Goalpara, report to mauzadars, who in their turn submit their returns to the Civil Surgeons in whose office the district returns are compiled.

SECTION VI.

HISTORY OF CHIEF DISEASES.

17. The annexed statement compares the ratios under the chief heads of mortality in 1917 with the average ratios of the preceding ten years.

Diseases. Chief causes of mortality.	1907-1916.			1917.		
	Urban.	Rural.	Combined.	Urban.	Rural.	Combined.
1	2	3	4	5	6	7
Cholera	2.38	2.67	2.66	1.69	1.81	1.81
Small-pox ... ... ... ...	.77	.54	.54	.42	.68	.68
Plague ... ... ... ...	...	...	...	...	...	...
Fever	9.39	14.66	14.56	7.03	15.96	15.78
Dysentery and diarrhoea	3.07	2.49	2.50	2.74	1.97	1.99
Respiratory diseases ... ... ... ...	.98	.60	.61	1.89	.87	.89
Injuries ... ... ... ...	.43	.32	.32	.58	.32	.33
All other causes	6.10	5.98	5.99	7.56	5.56	5.60
Total ...	23.14	27.29	27.21	21.95	27.19	27.09

In urban areas the mortality from the main diseases, *viz.*, cholera, small-pox, fever and dysentery and diarrhoea, except respiratory diseases, was lower in 1917 as compared with the preceding decennium. The increase under respiratory diseases is perhaps due to more correct diagnosis in towns in which Sanitary Inspectors have been appointed registrars. As regards rural areas, the mortality from cholera and dysentery and diarrhoea is lower than in the preceding decennium, while the rates for fever, small-pox and respiratory diseases show a little increase.

18. Cholera.

Districts.	Death-rate per mille.		
	1907-1916.	1917.	
1	2	3	
Cachar	2.21	.35	
Sylhet	2.75	.64	
Goalpara	2.13	.72	
Kamrup	2.84	9.31	
Darrang	3.26	4.13	
Nowgong	4.45	.60	
Sibsagar	2.72	.81	
Lakhimpur	1.86	.50	
Total ...	2.66	1.81	

Cholera prevailed in the months from March to July in three rural circles of Kamrup district. Eight Sub-Assistant Surgeons and an Assistant Surgeon were deputed to render medical aid to the people, and the Sub-Assistant Surgeons in charge of dispensaries in the affected areas also did cholera duty. In connection with this epidemic the Civil Surgeon remarks as follows :— " I had reason to believe that the figures of mortality from cholera as supplied to the civil authorities were sometimes wrong. In Barpeta subdivision an enquiry was held by the Sub-Inspector of vaccination at my instance. The total number of deaths from cholera as reported to the civil authorities for the week ending the 23rd June 1917 was 701, whereas enquiry of the Sub-Inspector showed only 35 deaths. Similarly, from Dharmapur mauza the deaths from 1st February to 9th April 1917 were reported to have

occurred in a single week in April." The actual ratio for Kamrup must therefore be accepted with reservations, although the main fact that a serious epidemic occurred in Barpeta subdivision is undeniable. The general fall in the mortality from this disease may to some extent be due to the improvement in the rural water-supply which has been carried out of late years, although it must be conceded that the amount of work done in this connection as compared with what remains to be done, hardly warrants so optimistic a view. In Darrang it is reported what the incidence of the epidemic was general, that there were no serious epidemics in any particular area and that dealing with the epidemic the services of Sub-Assistant Surgeons in charge of dispensaries concerned were utilised.

In no other district did the disease appear in epidemic form.

19. Amongst towns the highest rate of 32·11 per mille was reported from the

High rates of mortality from cholera in individual towns and rural areas. town of Mangaldai, where there was an epidemic in the months of May and June, the number of cases being 21.

The next highest rates of 4·78 and 4·46 were recorded in the towns of Hailakandi and Barpeta respectively. In both of these towns cholera broke out in the month of May. In Barpeta the infection was introduced from rural areas in which the disease was prevalent in epidemic form. Four towns (Habiganj, Nowgong, Nazira and North Lakhimpur) were free from the disease during the year under report, as compared with one in the preceding year. After deducting outside cases the corrected ratios for the towns of Gauhati, Dhubri and Dibrugarh were 1·2, ·34 and nil, respectively. As for rural circles considered individually the Bajali circle in Kamrup reported the highest rate of 33·02 per mille. The rates of 17·84 and 16·06 reported from two other circles, those of Raha and Nalbari, of this district are also high. All possible steps were taken to check the spread of the disease by the disinfection of water-supply, the sanitary disposal of dead bodies, medical treatment, etc., under the personal supervision of the Civil Surgeon, Mr. N. P. Neogi. The Kalaigaon circle in Darrang recorded the rate of 13·93. The Sub-Assistant Surgeons of the nearest dispensaries were sent out to render medical aid.

20. During the year 1917, 953 deaths from cholera were reported from tea estates, as compared with 1,498 in 1916, the ratios per mille being 1·35 and 2·13 respectively. The highest rates of 3·53 and 3·13 were recorded in the districts of Goalpara and Kamrup, respectively.

21. Small-pox.

Districts.	Death-rate per mille.		
	1907-1916.		1917.
	1	2	3
Cachar	...	...	·07
Sylhet	...	...	2·24
Goalpara	...	...	·24
Kamrup	...	...	·52
Darrang	...	...	·9
Nowgong	...	...	·79
Sibsagar	...	...	1·79
Lakhimpur	...	...	·74
	Total	...	·08
		·54	·04
		·96	·16
		·52	·13
		·24	·24
		·17	·17
		·06	·06
		·13	·13
		·54	·54
		·68	·68

The death-rate per mille in the Cachar district was very high as compared with the decennial average. The epidemic was widespread and it appears that the vaccination of that district should receive serious consideration. There was no serious epidemic in any other district during the year under report. Although the administration of the working of the vaccination department has been closer since the creation of a separate sanitary department, the lack of any general reduction in the small-pox mortality is disappointing. An examination of the strength of the cadre of vaccinators in comparison with the amount of work that ought to be undertaken annually, clearly indicates that the number of vaccinators employed in most districts is insufficient to permit of a visit being paid annually to every village by its circle vaccinator, and that the staff of vaccinators employed by Local Boards will have to be substantially increased. Proposals to this effect are under preparation and will be submitted later.

22. During the year under report 14 out of 20 towns escaped the disease as compared with 8 in the preceding year. The highest rate

High rates of mortality from small-pox in individual towns and rural areas.

of 2·84 per mille was recorded in Silchar town and probably the infection was brought into the town from rural

areas where it was prevalent in epidemic form. Sporadic

cases were reported from the towns of Dhubri, Sibsagar, Sylhet and Dibrugarh, and prompt measures were taken in vaccinating and revaccinating the people. In rural circles taken individually the highest rate of 10·99 was recorded in the Katigora circle in Cachar. The next highest rate (8·58) was reported from Raha circle in Kamrup, and 6·23 from Kanairghat circle in Sylhet. Seventeen rural circles were free from the disease.

23. Fevers.

Districts.	Death-rate per mille.		
			1917.
	1907-1916.	1917.	
1	2	3	
Cachar	...	...	11·73
Sylhet	...	...	13·11
Goalpara	...	...	13·42
Kamrup	...	...	27·46
Darrang	...	...	15·98
Nowgong	...	...	15·70
Sibsagar	...	...	18·91
Lakhimpur	...	...	19·15
	Total	...	12·11
		14·56	13·14
			11·40
			15·78

The death-rate from fevers during the year was 15·78 as compared with the decennial average of 14·56. As usual the Goalpara district had the highest mortality under this head, returning a ratio of 30·45. The ratios of Nowgong and Darrang districts were 19·15 and 18·91 respectively.

Although no special staff for the investigation of malaria problems was available on account of war restrictions, and although no general investigation has been possible, efforts have been made to investigate isolated instances of intense malaria prevalence and to suggest remedial measures. The most important of these investigations was carried out at Lumding, an important junction and district headquarters of the Assam-Bengal Railway. This investigation was undertaken at the request of the Railway Board of the Assam-Bengal Railway in consequence of representations made by Dr. Murray of that Railway in a report drawn up by him in 1914. The question was referred to the Sanitary Commissioner, Assam, by Dr. Francis, the Chief Medical Officer of the Railway, and in view of the interest and importance of the case it was decided to undertake the direction of an investigation following the lines indicated by some personal observations. Progress with the investigation was facilitated by the presence at Lumding of an able and careful observer in the person of Dr. Fry, the medical officer of the station whose painstaking observations on the lines suggested by the Sanitary Commissioner provided the bulk of the evidence on which the recommendations made in this scheme were based. Some earlier observations of a useful nature made by Captain J. F. James, I.M.S., have also to be acknowledged. The conclusions we reached were as follows :—

First, that a high degree of malaria infection existed in Lumding, and second, that the breeding grounds of the mosquitos which could act as carriers were as follows :—

- (1) The kucha drains of the station in which *M. Listoni* were found to breed.
- (2) A stream called the Horu Langpher in which *M. Culicifacies*, *N. Maculatus* and *M. Rossi* were propagated.
- (3) Borrow-pits in a brick-field, in which the larvæ of *N. Fuliginosus* were found.

Other potential propagation grounds, such as *bhils* and tanks, were found to be free from anopheline larvæ.

When the propagation areas had all been carefully defined, the case was referred to Mr. A. T. Duguid, A.M. I.C.E. (now Sanitary Engineer for the province), for the preparation of the rough plans and estimates of a scheme designed to prevent the breeding of M. Listoni by the substitution of pucca for kutcha drains throughout the station; for draining the borrow-pits of the brick-fields, and for improving the *bhils*, etc. It was decided that the stream should be treated by the systematic hand application of larvicides, as permanent works to prevent the breeding of anopheles in its bed would prove prohibitively expensive. The outline of the scheme as thus prepared by Mr. Duguid was then referred to Major S. R. Christophers, C.I.E., I.M.S., the well-known malaria expert, for favour of his advice on some doubtful points.

As his opinion was entirely favourable to the advice embodied in the note, it was forwarded to the Assam-Bengal Railway authorities as an anti-malarial scheme for Lumding. The proposals were accepted by the Assam-Bengal Railway Board and with some modifications of minor engineering details, work was commenced in 1917 on the detailed scheme as prepared by the Chief Engineer, Assam-Bengal Railway. The scheme is to cost roughly Rs. 1,12,000 and is financed by railway funds. After the close of the year under review a report kindly furnished by the Chief Medical Officer showed that substantial progress had been made, and that in spite of difficulties due to war, it is hoped to finish it within the time originally estimated, *viz.*, two seasons. Over 50,000 4-grain tablets of quinine were distributed free among the inhabitants of Lumding, from a supply of quinine tablets made by Government to the railway at reduced price.

It would be premature to attempt at this stage to estimate the success of these measures, but the experience derived from the preparation of the scheme would appear to indicate that it is possible for a medical officer who is interested in the subject and can spare the time for systematic observations, even if he has had no previous experience of such work, to collect with the help of the sanitary department sufficient data bearing upon the malariology of an area with which he is concerned to justify the preparation of an anti-malarial scheme for a tea estate, station or whatever it may be.

24. The towns of Mangaldai (29·05), Golaghat (22·36), Nazira (16·64), North Lakhimpur (16·41) and Maulvi Bazar (12·24) recorded high

High rates of mortality from fevers in individual towns and rural areas.

rates. In none of these towns have registrars with medical qualifications been appointed and it is probable that the inclusion of deaths due to febrile complaints of other

than malarial origin has swelled the figures of these towns as compared with others where diagnosis is more reliable. The rural registration circles which suffered most from fevers were Guma (50·39), three Sidli circles, Lakhipur (41·53), Bijni Duar (36·84), Forest villages (33·08), North Salmara (32·08), Golakganj (30·71), Ripu (30·58) and Goalpara (29·15) in Goalpara, Paneri (38·55) in Darrang, and Nowgong (37·33) in Nowgong. In the last two circles, the presence of *kala-azar* may complicate the case.

25. *Kala-azar*.

Districts.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.	1917.
1	2	3	4	5	6	7	8	9	10	11
Cachar	5	6	2	3	2	8	...	2	...
Sylhet	561	454	866	549	394	444	203	159	63
Goalpara	32	81	87	135	192	206	138	55	106
Kamrup	386	378	450	354	385	294	215	283	277
Darrang	619	643	627	679	563	399	317	310	320
Nowgong...	...	146	140	221	286	308	417	393	419	451
Sibsagar	2	1	...	34	31	29	24	5	28
Lakhimpur	...	5	...	50	11	...	...	8	...	3
Total ...	1,786	1,703	2,303	2,051	1,875	1,798	1,298	1,233	1,248	1,490

Much time and attention has been given to this disease during the year, owing to the discovery of its extension to areas formerly uninfected.

A detailed survey of the province was carried out in 1912-13 and 1913-14 and its results showed that up till then no extension of the infected area beyond the limits defined by Sir L. Rogers in 1897 had taken place. Since that survey our energies had been directed towards dealing with badly-infected villages in endemic areas of the Lower Assam districts and in maintaining a general watch over its activities in these areas through the agency of itinerating Sub-Assistant Surgeons, provided with travelling dispensary equipment. Towards the end of the touring season an outbreak in a village in the Sibsagar subdivision came to light which on investigation proved to be *kala-azar*. Reports of similar suspicious outbreaks in this subdivision followed, and it became evident that the situation, if not promptly and strenuously faced, was fraught with serious possibilities to the health of the Upper Assam districts.

A representative conference was called by the Chief Commissioner which met in Shillong on the 11th September 1917 and framed a plan of campaign. This was accepted by the Local Administration and is now in active operation under the control of this department, and the reversion of the Sanitary Commissioner to military duty was cancelled to retain the service of a public health officer to deal with the outbreak. Under the provisions of the Imperial Epidemic Diseases Act regulations were framed, and approved by the conference, by which on the recommendation of the Sanitary Commissioner, infected villages can be notified. These regulations prescribe certain rules by which emigration without permission from such infected areas is forbidden, they legalise the compulsory removal of infected and suspected families from infected to clean sites, and provide for the payment of compensation for property destroyed.

Similar rules were approved by the conference and promulgated by the Local Administration to deal effectively with outbreaks of *kala-azar* on tea estates, the main object of this set of rules being to prevent the absconding of panic-stricken labourers from an infected estate and laying down the procedure to be followed in stamping out the epidemic. It was decided that a detailed survey of the Sibsagar and Jorhat subdivisions should be undertaken, that the Golaghat subdivision should be resurveyed and that special attention should be given to the hyper endemic areas in Nowgong and Mangaldai of which our itinerating staff had kept us informed.

In regard to tea estates it was decided that the labour force of all tea estates in the Sibsagar district should be examined by medical officers of the tea industry, possessed of European qualifications, under the supervision of the Civil Surgeon of the district. Lastly it was decided that an indoor hospital for the reception of cases of *kala-azar* in the Sibsagar subdivision should be provided in some convenient centre.

Nine Sub-Assistant Surgeons were put at the disposal of the Sanitary Commissioner for the purposes of the general survey, and after a preliminary training at the Pasteur Institute at Shillong, certain areas were allotted to each of them, following the experience gained in the survey of 1912-13 and 1913-14. These men have been at work during the cold-weather months of the year under review under the supervision of Assistant Surgeon S. C. Mazumdar, and recommendations regarding the removal of infected and suspected families to new sites have been submitted in regard to all infected villages to the Deputy Commissioner of the district, who is responsible for carrying out the measures recommended. The survey of tea estates is proceeding satisfactorily and the operations aimed at dealing with the badly-infected tea estate of Duria are being energetically and thoroughly conducted by the Manager and Medical Officer.

Regrettable delays have prevented progress with the provision of the *kala-azar* hospital, owing to the objections which have been urged against any suitable sites that we could select, and during the period under review no progress can be reported with this portion of the scheme.

The survey will be completed with the termination of the cold-weather touring season of 1918 and its results will form the subject of a special report to Government.

It may not be out of place, in view of the importance of the subject, to anticipate to some extent this report and to note that in Golaghat there are three infected and notified villages of which two are new, in Jorhat one infected village has been discovered and notified, and in Sibsagar eight villages have been found to be infected, of which seven required to be notified.

The figures for the province show an increase over those of the previous year, but the total is not as high as that of 1913. The disease is tending towards extinction in Sylhet, but Nowgong in particular shows a decided increase, which is moreover cumulative, the figures of former years being compared, and a less optimistic view of the situation in this district must be adopted than was suggested in last year's report. *Kala-azar* is, as we know, endemic in Nowgong and the only practical policy appears to be that of dealing with badly-infected areas. Two large and badly-infected villages will be dealt with in the course of the present operations, but the upward trend of the mortality figures in this district suggests that it will be sound policy to spread our net wider in this district and to remove more infected villages next year.

The large increase in Sibsagar is due to the new outbreak to which I have referred above.

26. Dysentery and Diarrhoea.

Districts.	Death-rate per mille.		
			1917.
	1907-1916.	1917.	
1	2	3	
Cachar ...	... 2.40	... 1.90	
Sylhet ...	... 2.13	... 1.41	
Goalpara ...	... .40	... .28	
Kamrup ...	... 1.20	... .90	
Darrang ...	... 4.64	... 3.73	
Nowgong ...	... 1.78	... 1.77	
Sibsagar ...	... 4.55	... 3.75	
Lakhimpur ...	... 4.89	... 4.88	
Total ...	... 2.50	... 1.99	

As usual, the death-rates from dysentery and diarrhoea were higher in the Upper Assam districts of Darrang, Sibsagar and Lakhimpur than in other districts. As compared with the decennial average, there was a decrease except in Nowgong and in Lakhimpur where the rates were much the same.

The following table shows the death-rates from these diseases on tea estates in 1917 :—

Goalpara ...	... 19.46
Lakhimpur ...	... 10.02
Darrang ...	... 9.2
Sibsagar ...	... 9.0
Sylhet ...	... 5.25
Kamrup ...	... 5.15
Nowgong ...	... 5.0
Cachar ...	... 4.03

The Goalpara figures relate to a small population, but being consistently high are worthy of the attention of the district authorities. A pamphlet was drawn up by the Sanitary Commissioner and issued by the Local Administration to persons and firms connected with the tea industry in Assam calling attention to the substantial improvement which may be expected in the health of the labour force by introducing a system of conservancy to reduce the mortality and inefficiency caused by bowel complaints and hook worm, quoting facts and figures in support of this contention. It appears from opinions gathered in the course of the cold-weather tour that few, if any, of those connected with the tea industry now seriously contest the soundness of this view, and only a fear that the innate conservatism of the garden coolie may prevent the use of suitable conveniences, coupled with an unwillingness at the present juncture to undertake new expenditure, is delaying the realisation of this improvement. Signs are not lacking that when the first one or two septic tank latrines or other suitable installations have been proved to be useful, workable, and popular with the labour force, this reform will be widely adopted, and unless all previous experience in this connection is belied, a substantial reduction in these mortality figures may be expected to follow.

27. *Plague.*—No case of plague occurred in Assam during the year under report.

28. *Other causes of mortality.*—Deaths from "respiratory diseases," "injuries" and "all other causes" numbered 5,387, 1,997, and 33,897 in 1917 yielding ratios of .89, .33 and 5.60 per mille, respectively, against .84, .38 and 6.04, respectively, in the preceding year.

SECTION VII.

VACCINATION.

[Published separately.]

SECTION VIII.

SANITARY WORKS—MILITARY.

[No remarks.]

SECTION IX.

29. During the year 1917 the municipal institutions in this province were fifteen General municipalities and eight unions. A new union was constituted in the month of July 1917 at Polashbari in the sadr subdivision of the Kamrup district.

30. The total income of municipal institutions, including opening balances, amounted to Rs. 8,55,481 in 1917, as compared with Rs. 10,12,442 in 1916. Out of the above total receipts Rs. 4,67,770 or 54.68 per cent. was spent on sanitation, as compared with 43.98 in the previous year. The annexed table shows in sequence the percentage of income spent on sanitation by each local authority, with the exception of Polashbari which was constituted late in the year :—

1. Sylhet Municipality	...	...	...	...	76.84
2. Tezpur	"	...	...	...	68.49
3. Silchar	"	...	...	...	68.29
4. Gauhati	"	...	...	...	56.22
{ 5. Shillong	"	...	...	...	52.10
	"	...	...	...	52.10
7. Maulvi Bazar Union	...	...	...	...	51.19
8. Nazira	"	...	...	...	49.98
9. Karimganj Municipality	...	...	...	...	46.69
10. Sunamganj	"	...	...	...	46.56
11. Dibrugarh	"	...	...	...	44.18
12. Goalpara	"	...	...	...	43.40
13. Doom Dooma Union	...	...	...	...	39.03
14. Nowgong Municipality	...	...	...	...	38.56
15. Habiganj	"	...	...	...	37.84
16. Mangaldai Union	...	...	...	...	33.65
17. North Lakhimpur Union	...	...	...	...	31.04
18. Dhubri Municipality	...	...	...	...	28.39
19. Golaghat Union	...	...	...	...	24.01
20. Sibsagar Municipality	...	...	...	...	23.29
21. Hailakandi Union	...	...	...	...	19.12
22. Barpeta Municipality	...	...	...	...	18.21

The high percentage in the first three municipalities was due to the construction of pipe water-supplies.

Of the four municipal institutions at the bottom of the list, Barpeta which spends only 18 per cent. of its income on sanitary work calls for unfavourable notice, as sanitation is at a very low ebb in this town. The Golaghat Union may also be singled out for unfavourable notice, for similar reasons, and Sibsagar too should be able to apportion its finances better. Hailakandi, although it occupies a low place this year, is by no means badly maintained, owing to large expenditure in former years.

The subjoined table shows the total municipal expenditure on different heads of sanitation during the year 1917 against those in the previous year:—

Heads of expenditure.	Total expenditure.		Difference.	
	1917.	1916.	Increase.	Decrease.
1	2	3	4	5
Rs.	Rs.	Rs.	Rs.	Rs.
1. Conservancy, including establishment, road-watering, latrines, etc.	1,71,803	1,86,413	... 14,610	
2. Drainage	13,576	14,428	... 852	
3. Water-supply	2,64,253	2,25,060	39,193	
4. Disposal of the dead	624	580	44	
5. Markets and slaughter-houses	9,247	11,336	... 2,089	
6. Vaccination	2,476	1,894	582	
7. Other sanitary works	5,791	5,598	193	
Total ...	4,67,770	4,45,309	40,012 17,551	
8. Construction and maintenance of roads ...	80,027	88,977	... 8,950	
Total including roads ...	5,47,797	5,34,286	40,012 26,501	

31. No expenditure other than the usual charges for the pay and allowance of the Sanitary Inspectors, which amounted to Rs. 11,000, was met out of the Imperial recurring grant during the year 1917.

SURMA VALLEY DIVISION.

Cachar.—The pipe water-supply scheme for the town of Silchar has now been completed, the plant has been taken over by the municipality and a sample of water from the new water-works will be sent to the provincial laboratory at Shillong for bacteriological examination to determine the efficiency of the plant. Arrangements should now be made for periodical examination of water of this and of the two other new water-works opened during the year under report, and proposals for the employment of a sample taker for this purpose will shortly be submitted.

Sylhet.—The pipe water-supply scheme for the town of Sylhet has been completed with the exception of such items as stand posts, the low level intake and the staff quarters, work on which is still in progress.

Further progress with the conservancy improvement scheme in Sylhet has been slow, and during the year no effective action has been taken to increase the amount of night-soil removed, which is still very small. In spite of the amount of Government money expended in aid of the abovementioned scheme, the condition of the private latrines remains as bad as ever, and the inefficiency of the municipality in this department of work has seriously engaged the attention of Government.

A certain amount of progress with minor works has been maintained in other municipalities of the division, but no Sanitary Inspectors can at present be posted to them and more cannot be expected at present.

ASSAM VALLEY DIVISION.

Goalpara.—As it was found that the pumping wells would not yield a sufficient supply of water to meet the requirements of the town, the original scheme for the improvement of water-supply of the town of Dhubri has been modified and the source of its pipe water-supply will now be the river Brahmaputra. The modified scheme costs Rs. 97,868 against Rs. 58,065 of the original scheme and it is now

under consideration how the extra expenditure will be provided. A proposed pipe water-supply scheme for the town of Goalpara is in abeyance for want of funds, but the municipality is proceeding with the improvement of its conservancy system with funds provided from its own resources.

Kamrup.—Arrangements have been made for the monthly bacteriological examination of the water of the Gauhati water-works. The provision of pucca surface drains in Kayapatti is in progress, and Government has made a grant of Rs. 5,000 to the municipality for this work. The general scheme is in abeyance for want of funds.

Darrang.—The water-works at Tezpur have been completed during the year and the town is now supplied with filtered water, and a well for the improvement of the water-supply of the town of Mangaldai has been completed. The original drainage scheme for the town of Mangaldai has been recast so as to reduce its cost by the substitution of kutchha drains. The scheme is at present under the consideration of the Sanitary Board.

Sibsagar.—The work on the extension of one of the tanks in the town of Golaghat is in progress and it is expected that it will soon be completed. It is reported that the completion of two new drinking water tanks in the town of Nazira has been delayed by the unsatisfactory work of the contractors. As remarked in the preceding report, the scheme for the improvement of the water-supply in Sibsagar town is in abeyance for want of funds.

Lakhimpur.—A small scheme for the improvement of the surface drainage of Doom Dooma has been prepared and the clearance of drains in the town of North Lakhimpur in accordance with the instructions of the Sanitary Engineer is receiving attention.

HILL DISTRICTS.

The water-supply of a certain part of the town of Shillong which suffered from an epidemic of typhoid which was probably connected with the inadequacy of its drinking water-supply, has been supplemented by the municipality with Government aid with satisfactory results. The surface drainage of this area is also receiving attention, a scheme for its permanent improvement by the construction of pucca drains having been prepared. A rough estimate for the improvement of the water-supply, drainage and conservancy in the town of Jowai in the district of Khasi and Jaintia Hills is being prepared by the Sanitary Engineer in anticipation of the time when it will be possible to finance such schemes.

A scheme for the improvement of water-supply in Pasighat in the North-East Frontier by means of wells has been administratively approved and trial shafts are now being sunk.

An expenditure of Rs. 74,406 is reported to have been incurred by the Public Works Department on original works and repairs under the heads improvements to towns, drainage, water-supply and miscellaneous in 1917 in the province against Rs. 83,100 in the preceding year.

SECTION X.

GENERAL REMARKS.

32. Owing to the financial stringency imposed by the war the Local Administration was unable to make grants to Local Boards in aid of the third year's programmes of the scheme for the improvement of rural water-supply. Village sanitation. The wells and tanks provided in the first two years' programmes are now either completed or are approaching completion. The abnormally high price of iron has interfered with the complete protection of tanks by means of a fencing and jetty, according to the type plan issued by the Sanitary Board, and Local Boards have been advised as a temporary measure to use durable wood in the place of iron.

A special scheme for the improvement of water-supplies in the Kallang river area in Nowgong is in progress, but further progress with this scheme cannot be made for lack of necessary funds.

An aggregate expenditure of Rs. 2,08,868 has been incurred by Local Boards on rural sanitation, the main head of expenditure being the improvement of rural water-supply.

The thorny problem of rural sanitation has yet to be seriously tackled, but the constitution of village authorities is a movement from which good may be expected. A simple pamphlet in the vernacular showing to what ends the energies of village authorities may be suitably directed is now under issue and the question of how to secure from malicious damage and careless use, the fencing and water-drawing mechanism of rural water-supplies is also engaging attention.

It is clear that the absence of a staff to supervise such work makes even the beginnings of village sanitation very difficult and one of the first questions that should engage our attention when the present financial stringency is relaxed, is the provision of an adequate staff and of funds with which to deal with village sanitation.

33. The subjoined table shows the quantity of quinine sold district by district during the year 1917 as compared with that in the preceding year:—

Districts.	Treatment parcels sold in			Difference.	
	1917.	1916.		Increase.	Decrease.
				1	2
1	2	3	4	5	
Cachar ...	... 1,873	1,256	117	...	
Sylhet ...	10,292	7,852	2,440	...	
Khasi and Jaintia Hills ...	2,142	1,936	206	...	
Naga Hills ...	172	331	...	159	
Lushai Hills ...	1,391	1,116	275	...	
Goalpara ...	2,651	1,812	839	...	
Kamrup ...	1,369	965	464	...	
Darrang ...	829	788	41	...	
Nowrang ...	969	880	89	...	
Sibsagar ...	1,221	897	324	...	
Lakhimpur ...	370	372	...	2	
Garo Hills ...	122	...	122	...	
Manipur State ...	227	...	227	...	
Total ...	23,128	18,145	5,144	161	
Total increase ...	...	...	4,983	...	

The sales of quinine continue to increase, the present year's sales being about 25 per cent. greater than those of the preceding year. There is little doubt that this is due to an increasing appreciation of the value of the drug as a cure for malarial fever, but at the same time it has come to notice that certain other factors were operating to produce the demand and these may be explained as follows. The sale of a 'treatment' containing twenty tablets of 4 grains each at three annas was carried on at a loss to Government, with the object of providing a cheap remedy for the poorest villagers.

Owing to rise of the value of quinine in the open market, from war conditions, there was reason to fear that some of the Government quinine was bought up by vendors of patent fever cures and by medical practitioners and by employers of labour, etc., as in this way they obtain it cheaper than through the ordinary channels. It was also suspected that the retail of such treatments at three annas in Assam, while their price in Bengal had been raised to four annas, was leading to a leakage into Bengal.

Arrangements were therefore made with the Deputy Postmaster-General whereby sales in bulk from post offices were prohibited and a register with quarterly entries of the amount of sales in each post office is now maintained in this office, which is proving very informative, as an abnormal demand may mean either a malaria epidemic or irregular sales, either of which obviously calls for further investigation.

To prevent leakage to Bengal the price of the treatments was raised to four annas after the close of the year. It is probable however that it will eventually be found that it is not possible to benefit the poor man by sales at a price below the market value and it is for consideration whether sales at the market value, which is probably about five annas per tube, or one pice per tablet, coupled with free distribution, may not prove the better plan.

34. There is no important pilgrim traffic in Assam. A small *mela* called the Sidheswari *mela* was held as usual in the district of Cachar. Pilgrim traffic.

Temporary sheds, drains and latrines were provided, and there was no outbreak of any disease. The *mela* lasted for a fortnight and it is estimated that about 13,000 people attended.

35. During the year under report there were six coolie camps in existence in connection with constructions under the administration of the Assam-Bengal Railway. The usual sanitary arrangements, including the provision of water-supply, conservancy and ration supply, were made, and no epidemic was reported from any of them.

36. The Provincial Laboratory, which forms a part of the buildings of the Pasteur and Research Institute throughout the year, remained in charge of Assistant Surgeon Ram Taran Sen, L.M.S., who has done excellent work. The services of this officer have been lent to the Director of the Pasture Institute as part-time Assistant Director, and the resources of the laboratory including equipment have been utilised by the Institute to supplement deficiencies due to non-receipt of apparatus owing to the war. During the latter half of the year much of the material formerly examined by the laboratory has been handed over to the Research department, and only work of a definitely public health character has been retained, such as the chemical and bacteriological examinations of water, chemical analysis of food stuffs, such as milk, butter, ghi, etc., and other work directly connected with the sanitary department.

A new item of work introduced during the year is the bacteriological examination of vaccine lymph. All the vaccine lymph is now stored in the cold storage room of the Institute and examined at intervals to determine the point at which the disappearance of extraneous organisms takes place, before which it is not issued for use. The result of the innovation appears to have been a reduction in the 'septic arms' which were occasionally noticed in vaccination practice.

The Gauhati tap water is examined every month by bacteriological analysis, and the Shillong water is examined weekly. On several occasions during the year, the examination of the Shillong water revealed slight degrees of contamination due to repairs or alterations to the pipe line being in progress.

The following table shows the amount of work done during the year 1917 as compared with the preceding year:—

	1	2	3
		1916.	1917.
Chemical analysis of water	126
,, examination of ghi and fats	...	6	43
,, „ milk	...	16	50
,, „ mustard oil	...	7	27
,, „ other food stuff	...	85	1
,, „ urine	...	196	42
Bacteriological examination of water	...	72	87
,, „ blood film	...	158	67
,, „ spleenic smear	...	5	13
,, „ pus and other discharges	...	21	1
Bacteriological examination of sputa	...	22	10
,, „ urine	...	3	0
,, „ for agglutination	...	30	24
Wassermann reaction	3
Blood count and colour index	...	14	3
Examination of stools	...	15	13
Preparation of vaccine	...	3	0
Miscellaneous	...	1	3
Section-cutting	...	5	1
Examination of vaccine lymph	190
Silt	...	155	258
Total	...	952	962

37. The total number of emigrants to Assam that embarked under the supervision of the Embarkation Agent at Goalundo during the year 1917 was 20,961 against 77,084 in 1916 and 79,984 in 1915.

Emigration. These were despatched by the following routes, in the numbers noted below :—

To the Assam Valley by steamer	...	...	...	15,087
To Cachar and Sylhet by rail via Chandpur	...	...	...	5,874

Twenty-three cases of infectious diseases amongst emigrants were admitted into the Goalundo charitable hospital for treatment during the year (1 cholera, 7 small-pox, 14 chicken-pox and 1 measles) and there were two deaths, one being from cholera and the other from small-pox. There were also six deaths, viz., one from cholera and five from other diseases, on steamers during the voyage.

The number of emigrants travelling to Assam has thus been much below that of previous years.

Certain improvements which have been introduced during the year are worthy of mention. The vessels of the River Steamer Companies which carry emigrants have been provided with apparatus for the administration of the hypertonic saline treatment of cholera, together with a more up-to-date equipment and their medical officers have been trained in the use of the former apparatus.

Certain simple precautions have been taken to prevent the use of the river water at Goalundo which is frequently infective. These improvements, to which I referred last year, may have been operative in reducing the mortality from cholera.

Special feeding sheds, with a pipe water-supply, have been provided by the Eastern Bengal Railway at Santahar and Golakganj for the use of emigrants travelling by rail, although, owing to the paucity of emigrants, feeding arrangements have not yet been completed. 10,230 emigrants passed through this route and no sickness among them was reported. An emigration hospital has been provided for emigrants at Amingaon by Eastern Bengal Railway. The usual excellent arrangement, for the feeding of coolies *en route* have been maintained by the Assam-Bengal Railway.

It appears that it is not an uncommon practice for lepers to be sent to the recruiting districts as recruiting sirdars. Such leper sirdars are now stopped at Goalundo and are not allowed to proceed until the information necessary to prevent their being again so employed is forthcoming.

Proposals have been made to Government whereby the recovery of dépôt rent and dieting charges incurred in coolie dépôts, which was felt to be a heavy burden on the offices of Civil Surgeons, will be retransferred to the offices of District Magistrates, and it is understood that effect will be given to these, and some other changes in connection with the recovery of these charges.

Personal Proceedings. 38. I held the post of the Sanitary Commissioner during the year and carried out the following inspections :—

In January the Surma Valley Division was visited, the municipal institutions of Habiganj, Karimganj, Silchar, Hailakandi and Sylhet were inspected, Jaintiapore was visited by the orders of the Chief Commissioner, the rural water-supply of certain areas in Habiganj were investigated and district vaccination was tested wherever possible.

In February the town of Barpeta was inspected and the rural vaccination of the subdivision tested. The Municipality of Dhubri was visited and inspected and rural vaccination received attention.

In March the Municipalities of Sibsagar, Dibrugarh and Tezpur and the Unions of Nazira and Doom Dooma were inspected, some *kala-azar* infected villages were visited, district vaccination was inspected and a river trip was made to inspect the emigration dépôts on the Brahmaputra.

In April the Sanitary Report was prepared and a trip to Amingaon was made in connection with the movements of the Khasi Labour Corps.

In May and in part of June I paid some visits to Gauhati in connection with the sanitary arrangements for the Naga Labour Corps. Orders of transfer to military duty were received.

In June a visit was paid to Jowai to report on the proposed improvement of its sanitation.

In July Sylhet was visited in connection with the medical and sanitary arrangements for the recruitment and despatch of the Sylhet Labour Corps.

In August I proceeded to Rowmari by steamer to meet the Garo Labour Corps and accompanied them to Gauhati on concentration and again proceeded with them to Goalundo when movement orders were received.

In September no touring was done, owing to disposition following an accident. Proposals were submitted to the *kala-azar* conference for dealing with the outbreak of *kala-azar* in Upper Assam, in connection with which the orders of reversion to military duty were cancelled by the Chief Commissioner.

In October the control of the diphtheria epidemic in Shillong engaged attention and some lectures were delivered to the staff of Sub-Assistant Surgeons deputed for the *kala-azar* survey.

Touring was commenced after the Puja holidays, the newly-infected *kala-azar* area near Nazira was inspected, Kohima and Manipur were visited in connection with labour corps recruiting work, and a halt was made at Dimapur to investigate the alleged prevalence of *kala-azar* in the foot hills of the Naga Hills.

In December the Union of Golaghat was inspected and the *kala-azar* infected areas of the subdivision were inspected. Nazira was revisited, a new series of infected villages inspected, and the municipality of Sibsagar was inspected. At the close of the year, the municipality of Gauhati and the Labour Corps Depot were inspected.

T. C. McCOMBIE YOUNG, Major, I.M.S.,
Sanitary Commissioner, Assam.

SECTION XI.

ANNUAL REPORT OF THE SANITARY BOARD.

39. Throughout the year, the composition and scope of the Board remained the same. Sanction to the creation of the post of Sanitary Engineer was received and Mr. A. T. Duguid, A.M.I.C.E., who had held the post of special Public Works Department officer for the preparation of sanitary schemes, was appointed.

Three meetings were held to discuss matters of importance, and the advice of the Board on the following subjects was submitted to Government :—

- (1) Sunamganj town improvement scheme.
- (2) The inspection of municipal water-works by an engineering firm.
- (3) The supervision of all new municipal water-works by Executive Engineers.
- (4) The source of the proposed water-supply for the town of Dhubri.
- (5) The improvement of an insanitary area in Shillong.
- (6) The sanitary improvement of the town of Jowai.

The routine business of the Board was transacted by circulation of files. The following note was furnished by the Sanitary Engineer showing the work on which he had been engaged during the year ending 31st March 1918.

Water-supply schemes.

- 1. *Tezpur*.—The construction has been completed and the works opened.
- 2. *Silchar*.—The construction has been completed and the works opened.
- 3. *Sylhet*.—The progress on the construction has been satisfactory, but on account of non-delivery of certain materials from England the completion was delayed; but temporary arrangements were made and water has been turned on to the central portion of the town since November 1917.
- 4. *Dhubri*.—The construction was temporarily stopped, the scheme was to obtain water from infiltration wells, but the wells did not turn out a success and the scheme had to be recast. It is now proposed to pump direct from the Brahmaputra.
- 5. *Gauhati*.—Sanction has been given for a new pumping engine, but on account of the war there is a delay in getting delivery.
- 6. *Kohima*.—A project for improvements to the distribution system has been prepared by the Executive Engineer, Sibsagar Division; it is under consideration.
- 7. *Pasighat*.—Sanction has been given by the Local Administration to this scheme, and orders given to commence construction.
- 8. *Golaghat*.—An extension to this scheme is under construction.
- 9. *Nazira*.—This work is under construction.
- 10. *Mangaldai*.—The construction of the first part of the scheme has been completed.

11. *Shillong*.—The remodelling of part of the distributing system to make it suitable for fire extinguishing, and the enlarging of the main to Mawkhār have been completed.

12. *Sylhet Jail*.—A sketch project for improvement to the water-supply was prepared.

13. *Jorhat*.—Alterations have been made in this scheme to reduce the running charges.

14. *Tea gardens*.—Sketch projects for seven schemes were prepared.

Sewage and drainage schemes.

1. *Dibrugarh*.—A scheme and rough estimate to suit the altered conditions due to the rise in the high water level of the river have been prepared by the Executive Engineer.

2. *Shillong*.—A scheme and estimate for the drainage of Mowkhār have been prepared and is under consideration.

3. *Gauhati*.—Progress has been made in the construction of pucca drains in Kayapatti and near the college.

4. *Mangaldai*.—The drainage scheme has been recast to reduce the cost. It is under consideration.

5. *North Lakhimpur*.—This scheme was recast to reduce the cost and is now under construction.

6. *Sylhet Jail*.—A sketch project for a septic tank installation for the sewage disposal has been prepared.

7. *Berry-White Medical School*.—A septic tank installation for sewage disposal is under consideration.

8. *Tea gardens*.—A scheme for latrines and a septic tank for one tea garden has been prepared.

General.

1. *Jowai*.—A general scheme for the improvement of the water-supply, drainage, and conservancy has been prepared and submitted to the Sanitary Board for consideration.

2. The pumping plant of all larger water-works has been inspected by Messrs. Worthington Simpson & Co., Limited.

3. The construction of two of the small Bonificative schemes prepared last year have been completed as famine relief works.

T. C. McCOMBIE YOUNG, *Major, I.M.S.*,
Secretary, Sanitary Board, Assam.

STATEMENTS.

IMPERIAL STATEMENT No. I.—*Statement showing the births*

Number.	District.	Population according to the Census of 1911.			Number of births registered.		
		Male.	Female.	Total.	Male.	Female.	Total.
1	2	3	4	5	6	7	8
SURMA VALLEY.							
1	Cachar	... 246,205	... 223,962	470,167	7,505	7,125	14,630
2	Sylhet	... 1,268,469	... 1,204,202	2,472,671	36,376	34,085	70,461
	Total	... 1,514,674	... 1,428,164	2,942,838	43,881	41,210	85,091
ASSAM VALLEY.							
3	Goalpara	... 318,475	... 282,168	600,643	12,794	12,047	24,841
4	Kamrup	... 339,398	... 328,430	667,828	10,280	9,706	19,986
5	Darrang	... 198,581	... 178,733	377,314	6,824	6,682	13,506
6	Nowgong	... 154,938	... 148,658	303,596	5,445	5,115	10,560
7	Sibsagar	... 364,810	... 325,489	690,299	11,151	10,478	21,629
8	Lakhimpur	... 249,021	... 219,968	468,989	7,293	6,835	14,128
	Total	... 1,625,223	... 1,483,446	3,108,669	53,787	50,863	104,650
	Total for the Province	... 3,139,897	... 2,911,610	6,051,507	97,663	92,073	189,741

IMPERIAL STATEMENT No. II.—*Statement showing the births and deaths*

Number.	District.	Area, in square miles.	Average population per square mile.	Population (Census of 1911).			Births.		Number of deaths registered.		
				Male.	Female.	Total.	Total number.	Births per 1,000 of population.	Male.	Female.	Total.
1	2	3	4	5	6	7	8	9	10	11	12
SURMA VALLEY.											
1	Cachar	... 1,859	253	246,205	223,962	470,167	14,630	31·11	6,359	5,817	12,176
2	Sylhet	... 5,388	458	1,268,469	1,204,202	2,472,671	70,461	28·49	31,784	27,470	59,254
	Total	... 7,247	406	1,514,674	1,428,164	2,942,838	85,091	28·91	38,143	33,287	71,430
ASSAM VALLEY.											
3	Goalpara	... 3,954	151	318,475	282,168	600,643	24,841	41·35	11,081	9,343	20,424
4	Kamrup	... 3,858	173	339,398	328,430	667,828	19,986	29·92	10,735	9,829	20,564
5	Darrang	... 3,418	110	198,581	178,733	377,314	13,506	35·79	6,824	6,336	13,164
6	Nowgong	... 3,843	79	154,938	148,658	303,596	10,560	34·78	4,211	3,702	7,913
7	Sibsagar	... 4,996	138	364,810	325,489	690,299	21,629	31·33	9,111	8,373	17,484
8	Lakhimpur	... 4,529	103	249,021	219,968	468,989	14,128	30·12	6,877	6,069	12,946
	Total	... 24,598	126	1,625,223	1,483,446	3,108,669	104,650	33·66	48,843	43,652	92,405
	Total for the Province	31,845	190	3,139,897	2,911,610	6,051,507	189,741	31·35	86,986	76,939	163,926

registered in the districts of Assam during the year 1917.

Ratio of births per 1,000 of population.			Number of males born to every 100 females born.	Excess of births over deaths per 1,000 of population.	Excess of deaths over births per 1,000 of population.	Mean ratio of births per 1,000 during previous five years.		
Male.	Female.	Total.				Male.	Female.	Total.
9	10	11	12	13	14	15	16	17
15.96	15.15	31.11	105	5.22	...	16.04	15.19	31.24
14.71	13.78	28.49	107	4.53	...	16.79	15.43	32.23
14.91	14.00	28.91	106	4.64	...	16.67	15.39	32.07
21.30	20.05	41.35	106	7.35	...	20.10	18.88	38.99
15.39	14.53	29.92	106	...	87	15.88	14.83	30.71
18.08	17.70	35.79	102	91	...	17.95	17.28	35.23
17.93	16.84	34.78	106	8.72	...	15.74	14.93	30.67
16.15	15.17	31.33	106	6.01	...	16.53	15.45	31.98
15.55	14.57	30.12	107	2.52	...	14.73	13.90	28.64
17.30	16.36	33.66	105	3.91	...	16.90	15.92	32.82
16.14	15.21	31.35	106	4.26	...	16.79	15.66	32.46

registered in the districts of Assam during the year 1917.

Number of deaths of males to every 100 deaths of females.	Deaths per 1,000 of population from—												Mean ratio of deaths per 1,000 during the previous five years							
	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and Diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	All causes.			Male.	Female.	Total.	Male.	Female.	Total.			
									13	14	15	16	17	18	19	20	21	22	23	24
109	.35	2.24	...	13.11	1.90	1.05	.35	6.87	25.82	25.97	25.89	23.98	24.38	24.17						
116	.64	.52	...	13.42	1.41	.69	.37	6.88	25.05	22.81	23.96	27.44	25.56	26.53						
114	.59	.79	...	13.37	1.49	.75	.37	6.88	25.19	22.30	24.27	26.88	25.38	26.15						
118	.72	.79	...	30.45	.28	.12	.40	1.21	34.79	33.11	34.00	35.48	34.65	35.99						
109	9.31	.74	...	15.70	.90	.31	.23	3.56	31.62	23.92	30.79	25.52	23.24	24.29						
108	4.13	.08	...	18.91	3.73	1.63	.36	6.01	34.38	35.44	34.88	35.35	36.88	36.07						
114	.60	.04	...	19.15	1.77	.40	.25	3.81	27.17	24.00	26.06	27.50	26.58	27.05						
109	.81	.96	...	13.14	3.75	1.35	.23	5.06	24.97	25.72	25.32	24.91	25.63	25.25						
113	.50	.16	...	11.40	4.98	2.57	.27	7.69	27.61	27.59	27.60	25.33	25.85	25.57						
111	2.96	.57	...	18.06	2.46	1.01	.29	4.39	30.05	23.42	29.75	28.69	28.30	28.51						
113	1.81	.68	...	15.78	1.99	.89	.33	5.00	27.70	26.42	27.09	27.82	26.87	27.36						

IMPERIAL STATEMENT No. III.—Deaths registered in the

No.	District.	January.	February.	March.	April.	May.
1	2	3	4	5	6	7
SURMA VALLEY.						
1	Cachar	1,195	929	991	1,052	1,005
2	Sylhet	6,103	5,086	4,633	4,727	4,531
	Total	7,298	6,015	5,624	5,779	5,536
ASSAM VALLEY.						
3	Goalpara	1,961	1,116	1,291	1,687	1,831
4	Kamrup	1,141	958	1,230	2,174	3,482
5	Darrang	1,021	726	774	878	1,631
6	Nowgong	558	469	799	612	669
7	Sibsagar	1,285	1,029	1,021	1,070	1,316
8	Lakhimpur	856	709	855	1,021	1,132
	Total	6,822	5,007	5,970	7,442	10,061
	Total for the Province	14,120	11,022	11,594	13,221	15,597
	Ratio per 1,000	2.33	1.82	1.91	2.18	2.57

IMPERIAL STATEMENT No. IV.—Deaths registered according to

No.	District.	Under 1 year.		1 and under 5.		5 and under 10.		10 and under 15.	
		Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
1	2	3	4	5	6	7	8	9	10
SURMA VALLEY.									
1	Cachar	1,431	1,228	940	964	534	464	251	203
2	Sylhet	7,803	6,374	3,961	3,597	2,128	1,890	1,243	765
	Total	9,234	7,602	4,901	4,561	2,662	2,354	1,494	968
ASSAM VALLEY.									
3	Goalpara	3,069	2,649	1,714	1,603	1,000	753	443	362
4	Kamrup	2,156	1,860	1,706	1,605	1,361	1,098	652	469
5	Darrang	1,415	1,365	943	985	475	422	277	186
6	Nowgong	1,086	936	605	636	386	282	249	138
7	Sibsagar	1,511	1,258	1,553	1,473	719	686	389	329
8	Lakhimpur	959	814	996	1,039	519	425	264	210
	Total	10,196	8,882	7,517	7,341	4,460	3,666	2,274	1,694
	Total for the Province	19,430	16,484	12,418	11,902	7,122	6,020	3,768	2,662
	Population	106,330	106,901	356,689	374,837	491,403	482,110	333,555	264,628
	Ratio per 1,000	182.73	154.19	34.81	31.75	14.49	12.48	11.29	10.06

districts of Assam during each month of the year 1917.

June.	July.	August.	September.	October.	November.	December.	Total.
8	9	10	11	12	13	14	15
1,147	1,060	1,062	816	840	934	1,145	12,176
4,373	4,519	4,325	4,310	4,349	5,377	6,921	59,254
5,520	5,579	5,387	5,126	5,189	6,311	8,066	71,430
1,662	2,034	1,911	1,734	1,492	1,688	2,017	20,424
3,197	2,281	1,253	1,114	1,080	1,297	1,357	20,564
1,427	1,223	1,116	928	958	1,216	1,266	13,164
669	666	788	674	631	739	639	7,913
1,775	1,940	1,573	1,604	1,749	1,576	1,546	17,481
994	1,348	1,268	1,067	1,210	1,234	1,252	12,916
9,724	9,492	7,909	7,121	7,120	7,750	8,077	92,495
15,244	15,071	13,296	12,247	12,309	14,061	16,143	163,925
2·52	2·49	2·19	2·02	2·03	2·32	2·66	27·09

age in the districts of Assam during the year 1917.

15 and under 20.		20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.	
Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
11	12	13	14	15	16	17	18	19	20	21	22
235	301	577	740	668	583	531	393	477	354	715	587
1,100	1,470	2,728	3,755	3,324	2,738	2,881	1,737	2,381	1,736	4,235	3,358
1,335	1,771	3,305	4,495	3,992	3,371	3,412	2,130	2,858	2,090	4,950	3,945
316	477	825	1,031	1,019	786	895	540	849	498	951	644
401	513	940	1,216	1,051	1,046	890	673	717	640	861	709
211	253	620	837	948	939	837	525	613	460	479	364
170	149	318	398	378	366	372	237	336	264	311	246
297	363	829	1,268	1,112	1,247	1,005	666	845	517	851	566
189	232	676	994	1,136	1,093	935	544	703	366	500	352
1,584	1,987	4,218	5,744	5,644	5,477	4,934	3,235	4,063	2,745	3,953	2,881
2,919	3,753	7,523	10,239	9,636	8,848	8,346	5,365	6,921	4,835	8,903	6,836
231,893	245,076	526,427	563,035	501,836	399,477	303,554	224,199	167,715	136,717	120,495	114,630
12·59	15·33	14·29	18·18	19·20	22·15	27·49	23·93	41·26	35·36	73·88	59·54

IMPERIAL STATEMENT No. V.—Deaths registered according

Number.	District.	Population according to Census of 1911.					
		Christians.	Hindus.	Muslims.	Buddhists.	Other classes.	Total.
1	2	3	4	5	6	7	8
SURMA VALLEY.							
1	Cachar	1,117	305,035	155,653	24	8,538	470,167
2	Sylhet	1,512	1,098,950	1,364,739	20	7,450	2,472,671
Total		2,629	1,403,985	1,520,392	44	15,788	2,942,838
ASSAM VALLEY.							
3	Goalpara	5,252	334,720	211,562	955	48,154	600,643
4	Kamrup	2,535	459,227	64,627	574	140,865	667,828
5	Darrang	1,913	245,341	20,305	609	109,146	377,314
6	Nowgong	1,373	177,795	15,689	41	108,698	303,596
7	Sibsagar	5,410	595,266	29,718	1,964	57,941	690,299
8	Lakhimpur	4,789	367,990	13,419	5,648	77,143	468,989
Total		21,272	2,180,339	355,320	9,791	541,947	3,108,639
Total for the Province		23,901	3,584,324	1,875,712	9,835	557,735	6,051,507

IMPERIAL STATEMENT No. VI.—*Deaths registered from different*

to class in the districts of Assam during the year 1917.

Number of deaths registered.							Ratio of deaths per 1,000 of population.						
Christians.	Hindus.	Muslims.	Buddhists.	Other classes.	Total.	Christians.	Hindus.	Muslims.	Buddhists.	Other classes.	Total.		
9	10	11	12	13	14	15	16	17	18	19	20		
13	6,807	4,690	...	666	12,176	11·63	22·31	30·13	...	79·87	25·89		
9	24,214	34,076	...	955	59,254	5·95	22·03	24·96	...	128·18	23·96		
22	31,021	38,766	...	1,621	71,430	8·36	22·09	25·49	...	102·67	24·27		
197	8,941	8,330	12	2,944	20,424	37·50	26·71	39·37	12·56	61·13	34·00		
27	14,590	1,997	...	3,950	20,564	10·65	31·77	30·90	...	28·04	30·79		
67	7,300	945	1	4,851	13,164	35·02	29·75	46·54	1·64	44·44	34·88		
45	4,761	697	...	2,410	7,913	32·77	26·77	44·42	1	22·17	26·06		
91	14,207	578	49	2,559	17,484	16·82	23·86	19·44	24·94	44·16	25·32		
61	9,903	254	93	2,635	12,946	12·73	26·91	18·92	16·46	34·15	27·60		
488	59,702	12,801	155	19,349	92,495	22·94	27·38	36·02	15·83	35·70	29·75		
510	90,723	51,567	155	20,970	163,925	21·34	25·31	27·49	15·76	37·59	27·09		

causes in the districts and towns of Assam during the year 1917.

Causes.							Ratio of deaths per 1,000 of population.											
Wounds or accidents.	Snakes and wild animals.	Rabies.	Total.	All other causes.	Total.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	From all causes.	For the year.	Mean of previous five years.	Number.	
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
142	13	...	160	3,151	11,979	.33	2·24	...	13·32	1·91	1·03	.34	6·85	26·04	24·31	1		
803	66	...	901	16,789	58,630	.63	.52	...	13·51	1·43	.68	.36	6·87	24·00	26·57	2		
950	79	...	1,061	19,940	70,609	.58	.79	...	13·48	1·48	.74	.36	6·87	24·33	26·21			
163	60	...	234	628	20,171	.70	.80	...	30·97	.24	.06	.39	1·06	34·25	35·34	3		
59	39	...	152	2,196	19,977	9·51	.77	...	15·97	.82	.25	.23	3·40	30·99	24·39	4		
75	43	...	136	2,204	12,999	4·14	.08	...	19·14	3·73	1·59	.36	5·93	35·00	36·13	5		
40	21	...	74	1,118	7,778	.61	.65	...	19·31	1·76	.34	.24	3·74	26·08	26·97	6		
96	28	1	151	3,439	17,177	.79	.98	...	13·18	3·79	1·37	.22	5·09	25·46	25·35	7		
97	14	...	119	3,468	12,592	.51	.15	...	11·59	5·01	2·60	.26	7·65	27·81	25·54	8		
530	205	1	866	13,053	90,694	2·98	.57	...	18·33	2·44	.99	.28	4·30	29·93	28·59			
1,480	284	1	1,927	32,993	161,303	1·81	.69	...	15·96	1·97	.87	.32	5·56	27·19	27·43			

IMPERIAL STATEMENT No. VI.—Deaths registered from different causes

Number.	Districts and towns.	Population according to Census of 1911.	In-							
			Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Suicide.	
1	2	3	4	5	6	7	8	9	10	11
TOWNS.										
SURMA VALLEY.										
1	Silchar	8,785	3	25	..	31	12	21	..	..
2	Hailakandi	1,462	7	..	..	6	3	1	..	..
3	Sylhet	14,457	20	8	..	79	53	31	..	..
4	Karimganj	3,052	1	..	..	25	3	1	..	..
5	Maulvi Bazar	2,369	6	..	..	29	9	3	..	..
6	Habiganj	6,244	..	..	..	38	5	4	..	..
7	Sunamganj	4,620	10	..	..	30	10	1	..	..
	Total	40,989	47	33	..	238	95	62	..	..
ASSAM VALLEY.										
8	Dhubri	5,808	3	5	..	18	8	19	..	..
9	Goalpara	5,964	19	1	..	36	14	20	..	..
10	Gauhati	12,481	40	..	..	101	38	31	..	..
11	Barpeta	10,739	48	..	..	91	35	13	..	1
12	Tezpur	5,355	1	..	..	8	16	23	1	..
13	Mangaldai	654	21	..	..	19	8	1	..	..
14	Nowgong	5,433	..	..	..	54	15	21	..	..
15	Sibsagar	5,764	14	4	..	41	9	..	..	..
16	Nazira	2,583	..	..	..	43	6	..	..	..
17	Jorhat	5,231	1	..	..	46	12	5	..	..
18	Golaghat	2,236	8	..	..	50	3	..	..	..
19	Dibrugarh	14,563	1	8	..	68	61	29	..	..
20	North Lakhimpur	1,645	..	..	..	27	8	2	..	..
	Total	78,456	156	18	..	602	233	164	1	1
	Total of towns	119,445	203	51	..	840	328	226	1	1
	Total for the Province	6,051,507	10,953	4,116	..	95,518	12,057	5,387	103	61

*Mean of previous

in the districts and towns of Assam during the year 1917—concluded.

juries.				Ratio of deaths per 1,000 of population.														Number.
Wounds or accidents.	Snakes and wild animals.	Rabies.	Total.	All other causes.			Total.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	From all causes.	For the year.	Mean of previous five years.
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28		
5	2	..	..	7	72	171	.34	2.84	...	3.52	1.36	2.39	.79	8.19	19.46	19.12	1.
..	..	..	..	..	9	26	4.78	..	..	4.10	2.05	.68	..	6.15	17.78	9.57	2
10	..	..	..	10	107	308	1.38	.55	..	5.46	3.66	2.14	.69	7.40	21.30	26.97	3
..	..	..	..	..	16	46	.32	..	..	8.19	.98	.32	..	5.24	15.07	24.57	4
2	1	..	..	3	5	55	2.53	..	..	12.24	3.79	1.26	1.26	2.11	23.21	18.57	5
5	..	..	..	5	52	104	..	..	..	6.08	.80	.64	.80	8.32	16.65	19.21	6
2	1	..	..	3	57	111	2.16	..	..	6.49	2.16	.21	.64	12.33	24.02	17.31	7
24	4	..	..	28	318	821	1.14	.80	..	5.80	2.31	1.51	.68	7.75	20.03	21.73	
5	1	..	..	6	52	111	.51	.86	..	3.09	1.37	3.27	1.03	8.95	19.11	21.69	8
2	..	..	..	2	50	142	3.18	.16	..	6.03	2.34	3.35	.33	8.38	23.80	23.47	9
1	1	..	..	2	114	326	3.20	..	..	8.09	3.04	2.48	.16	9.13	26.11	17.94	10
1	1	..	..	3	71	261	4.46	..	..	8.47	3.25	1.21	.27	6.61	24.30	32.21	11
2	..	..	..	3	59	110	.18	..	..	1.49	2.98	4.29	.56	11.01	20.54	31.37	12
..	..	..	..	..	6	55	32.11	..	..	29.05	12.23	1.52	..	9.17	84.09	41.28	13
4	..	..	..	4	41	135	..	..	..	9.93	2.76	3.86	.73	7.54	24.84	31.65	14
3	..	..	..	3	21	92	2.42	.69	..	7.11	1.56	..	.52	3.64	15.96	20.12	15
3	..	..	..	3	2	54	..	..	..	16.64	2.32	..	1.16	.77	20.90	18.97*	16
3	..	..	..	3	22	89	.19	..	..	8.79	2.29	.95	.57	4.20	17.01	26.38	17
2	..	..	..	2	9	72	3.57	..	..	22.36	1.34	..	.89	4.02	32.20	25.35	18
8	..	..	..	8	124	299	.06	.54	..	4.66	4.18	1.99	.54	8.51	20.53	26.02	19
1	2	..	..	3	15	55	..	..	..	16.41	4.86	1.21	1.82	9.11	33.43	30.39	20
35	5	..	..	42	586	1,801	1.98	.23	..	7.67	2.97	2.09	.53	7.47	22.95	25.27	
59	9	..	..	70	904	2,622	1.69	.42	..	7.03	2.74	1.89	.58	7.56	21.95	24.06	
1,539	293	1	1,997	33,897	163,925	1.81	.68	..	15.78	1.99	.89	.33	5.60	27.09	27.36			

three years.

IMPERIAL STATEMENT No. VII.—Deaths registered from Cholera in the

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from cholera were reported.	Number in each district.	Number from which deaths from cholera were reported.					
1	2	3	4	5	6	7	8	9	10	11
SURMA VALLEY.										
1	Cachar :	8	7	1,103	21	2	1	12	25	48
2	Sylhet :	22	21	10,781	407	6	39	294	477	419
	Total :	30	23	11,884	428	8	40	306	502	467
ASSAM VALLEY.										
3	Goalpara :	21	15	2,137	81	113	12	3	71	134
4	Kamrup :	11	11	1,954	45*	20	91	421	1,164	2,166
5	Darrang :	12	10	1,406	261	6	6	22	68	641
6	Nowgong :	8	5	1,495	16*	2	...	76	14	9
7	Sibsagar :	11	10	2,143	147	6	11	36	51	95
8	Lakhimpur :	7	5	1,702	16	2	5	7	10	32
	Total :	70	56	10,837	566	149	125	565	1,373	3,077
	Total for the Province	100	84	22,721	994	157	165	871	1,880	3,544

* Mauzas.

IMPERIAL STATEMENT No. VIII.—Deaths registered from

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.	June.	July.
		Number in each district.	Number from which deaths from small-pox were reported.	Number in each district.	Number from which deaths from small-pox were reported.							
1	2	3	4	5	6	7	8	9	10	11	12	13
SURMA VALLEY												
1	Cachar :	8	7	1,103	140	162	219	199	144	111	84	36
2	Sylhet :	22	13	10,781	334	140	250	205	184	171	83	57
	Total :	30	20	11,884	474	302	409	504	528	282	167	93
ASSAM VALLEY.												
3	Goalpara :	21	13	2,137	123	37	39	31	64	121	52	69
4	Kamrup :	11	7	1,954	21*	16	20	45	75	82	60	37
5	Darrang :	12	8	1,406	21	1	...	1	5	4	2	2
6	Nowgong :	8	3	1,495	8*	3	2	...	1	...	1	...
7	Sibsagar :	11	7	2,143	59	59	43	78	63	90	108	85
8	Lakhimpur :	7	4	1,702	24	...	9	3	...	2	11	23
	Total :	70	42	10,837	256	116	113	158	208	299	234	218
	Total for the Province	100	62	22,721	730	418	582	662	536	581	401	311

* Mauzas.

districts of Assam during each month of the year 1917.

June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
27	14	8	8	8	9	3	83	82	165	.33	.36	.35	2.12	1
195	74	16	7	12	6	45	907	683	1,590	.71	.56	.64	2.39	2
222	88	24	15	20	15	48	990	765	1,755	.65	.52	.59	2.35	
52	21	18	2	4	2	4	199	237	436	.62	.83	.72	2.81	3
1,472	644	116	44	12	61	10	3,038	3,183	6,221	8.95	9.69	9.31	3.03	4
424	125	19	16	7	54	172	817	743	1,560	4.11	4.15	4.13	3.70	5
21	4	6	6	2	39	5	118	66	184	.76	.44	.60	5.88	6
153	68	26	46	46	14	10	284	278	562	.77	.85	.81	2.45	7
61	44	22	22	12	16	2	134	101	235	.53	.45	.50	1.05	8
2,183	906	207	136	83	186	203	4,590	4,608	9,198	2.82	3.10	2.96	2.92	
2,405	994	231	151	103	201	251	5,580	5,373	10,953	1.77	1.84	1.81	2.64	

Small-pox in the districts of Assam during each month of the year 1917.

August.	September.	October.	November.	December.	Total.			Under 1 year.	One to 10 years.	Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
					Male.	Female.	Total.			Male.	Female.	Total.		
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
33	18	15	17	18	558	498	1,056	218	395	2.26	2.22	2.24	.12	1
47	31	9	3	11	752	539	1,291	188	331	.59	.44	.52	.39	2
80	49	24	20	29	1,310	1,037	2,347	406	726	.86	.72	.79	.34	
26	12	5	18	6	281	199	480	57	132	.88	.70	.79	.79	3
12	7	17	74	53	263	230	408	125	208	.78	.69	.74	1.77	4
1	...	7	...	10	22	11	33	2	2	.11	.06	.08	.58	5
...	5	1	1	1	6	9	15	4	2	.03	.06	.04	.44	6
39	15	16	26	43	380	285	665	20	23	1.04	.87	.96	.60	7
12	1	2	5	8	44	34	78	9	17	.17	.15	.16	.08	8
90	40	48	124	121	1,001	768	1,769	217	474	.61	.51	.57	.79	
170	89	72	144	150	2,311	1,805	4,116	623	1,200	.73	.62	.68	.57	

IMPERIAL STATEMENT No. IX.—*Deaths registered from Fever*

• Mauzas.

IMPERIAL STATEMENT No. X.—*Deaths registered from*

Number.	District.	Circles of Registration.			Villages.			January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from dysentery and diarrhoea were reported.	Number in each district.	Number from which deaths from dysentery and diarrhoea were reported.							
1	2	3	4	5	6	7	8	9	10	11		
SURMA VALLEY.												
1	Cachar	...	...	8	7	1,103	172	71	43	65	113	89
2	Sylhet	...	...	22	21	10,781	1,923	455	364	275	329	288
	Total	...		30	28	11,884	2,095	526	407	340	442	377
ASSAM VALLEY.												
3	Goalpara	...	...	21	16	2,137	74	10	13	17	25	22
4	Kamrup	...	...	11	10	1,954	26*	26	26	23	51	85
5	Darrang	...	...	12	11	1,406	280	89	75	65	121	157
6	Nowgong	...	...	8	8	1,495	43*	40	29	108	34	56
7	Sibsagar	...	...	11	11	2,143	820	142	125	101	129	206
8	Lakhimpur	...	...	7	7	1,702	98	130	81	107	165	220
	Total	...		70	63	10,837	1,341	437	349	421	525	746
Total for the Province...												
		100	91	22,721	3,436	963	756	761	967	1,123		

• Mauzas.

Mortality in districts of Assam during each month of the year 1917.

June.	July	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
696	615	656	467	416	482	679	3,254	2,912	6,166	13.21	13.00	13.11	11.53	1
2,745	2,921	2,999	2,661	2,564	3,125	3,926	17,828	15,367	33,195	14.05	12.76	13.42	11.93	2
3,441	3,536	3,655	3,128	2,980	3,607	4,605	21,082	18,279	39,361	13.91	12.79	13.37	11.87	
1,408	1,836	1,760	1,623	1,396	1,591	1,879	9,910	8,382	18,292	31.11	29.70	30.45	28.76	3
1,270	1,274	833	761	763	866	1,000	5,623	4,868	10,491	16.56	14.82	15.70	14.92	4
644	704	670	499	489	717	673	3,701	3,436	7,137	18.63	19.22	18.91	19.29	5
532	535	618	508	449	499	455	3,052	2,762	5,814	19.69	18.57	19.15	15.07	6
881	1,142	893	897	915	753	820	4,773	4,303	9,076	13.08	13.22	13.14	11.78	7
323	566	516	434	554	545	589	2,867	2,480	5,347	11.51	11.26	11.40	11.38	8
5,058	6,057	5,290	4,722	4,566	4,971	5,416	29,926	26,231	56,157	18.41	17.68	18.06	16.91	
8,499	9,593	8,945	7,850	7,546	8,578	10,021	51,008	44,510	95,518	16.24	15.28	15.78	14.49	

Dysentery and Diarrhoea in the districts of Assam during each month of the year 1917.

June.	July	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.	Number.
							Male.	Female.	Total.	Male.	Female.	Total.		
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
82	95	73	56	59	75	73	482	412	894	1.95	1.83	1.90	2.44	1
235	247	217	249	240	281	328	1,971	1,537	3,508	1.55	1.27	1.41	2.28	2
317	342	290	305	299	356	401	2,453	1,949	4,402	1.62	1.36	1.49	2.31	
25	8	16	5	7	17	4	100	69	169	.31	.24	.28	.42	3
85	77	42	45	50	36	60	353	253	606	1.04	.76	.90	.91	4
145	138	136	137	149	114	83	779	630	1,409	3.92	3.52	3.73	4.16	5
29	25	42	49	48	43	37	311	229	540	2.00	1.54	1.77	1.60	6
287	293	237	284	301	304	182	1,420	1,171	2,591	3.89	3.59	3.75	4.36	7
258	315	281	236	196	206	145	1,306	1,024	2,340	5.24	4.70	4.98	4.55	8
829	856	754	756	751	720	511	4,269	3,386	7,655	2.62	2.28	2.46	2.59	
1,146	1,198	1,044	1,061	1,050	1,076	912	6,722	5,335	12,057	2.14	1.83	1.99	2.45	

IMPERIAL STATEMENT No. XI.—*Deaths registered from*

Number	District.	Circles of Registration.		Villages.					January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from respiratory diseases were reported.	Number in each district.	Number from which deaths from respiratory diseases were reported.								
1	2	3	4	5	6	7	8	9	10	11			
SURMA VALLEY.													
1	Cachar	...	...	8	7	1,103	110	40	41	27	61	47	
2	Sylhet	...	...	23	21	10,781	567	193	231	157	155	121	
	Total	...	...	20	28	11,884	677	233	272	184	216	168	
ASSAM VALLEY.													
3	Goalpara	...	...	21	12	2,137	30	10	8	3	5	5	
4	Kamrup	...	...	11	10	1,954	18	19	26	20	17	17	
5	Darrang	...	...	12	10	1,406	100	62	44	67	55	41	
6	Nowgong	...	...	8	6	1,495	30	12	8	18	12	7	
7	Sibsagar	...	...	11	8	2,143	153	100	74	104	83	70	
8	Lakhimpur	...	...	7	7	1,702	36	83	87	134	153	90	
	Total	...	...	70	53	10,837	367	236	247	346	325	230	
	Total for the Province	...	...	100	81	22,721	1,044	519	519	530	541	398	

IMPERIAL STATEMENT No. XII.—*Deaths registered from Plague*

Number.	District.	Circles of Registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from plague were reported.	Number in each district.	Number from which deaths from plague were reported.					
1	2	3	4	5	6	7	8	9	10	11
SURMA VALLEY.										
1	Cachar ...	8	...	1,103	...	...	...	...	...	...
2	Sylhet ...	22	...	10,781	...	...	...	...	...	...
	Total	30	...	11,884	...	...	...	...	...	...
ASSAM VALLEY.										
3	Goalpara ...	21	...	2,137	...	...	...	...	...	...
4	Kamrup ...	11	...	1,954	...	...	...	...	...	...
5	Darrang ...	12	...	1,406	...	...	...	...	...	...
6	Nowgong...	8	...	1,495	...	...	...	...	...	...
7	Sibsagar ...	11	...	2,143	...	...	...	...	...	...
8	Lakhimpur	7	...	1,702	...	...	...	...	...	...
	Total	70	...	10,837	...	...	...	...	...	...
	Total for the Province ...	100	...	22,721	...	...	...	...	...	...

Pespiratory diseases in the districts of Assam during each month of the year 1917.

June.	July.	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.			Number.
							Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.	
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
38	43	38	30	42	50	39	302	194	496	1.22	.86	1.05	.76	1		
91	127	103	99	101	136	208	1,106	616	1,722	.87	.51	.69	.62	2		
129	170	141	129	143	186	247	1,408	810	2,218	.92	.56	.75	.64			
9	4	2	8	5	8	8	58	17	75	.18	.06	.12	.12	3		
12	26	9	24	14	11	15	134	76	210	.39	.23	.31	.28	4		
38	52	47	31	69	65	46	392	225	617	1.97	1.25	1.63	1.36	5		
6	8	11	10	9	11	11	70	53	123	.45	.35	.40	.22	6		
77	46	69	64	70	79	90	574	361	935	1.57	1.10	1.35	.94	7		
65	86	77	84	89	120	141	768	441	1,209	3.08	2.00	2.57	1.97	8		
207	221	215	221	265	294	311	1,996	1,173	3,169	1.23	.79	1.01	.78			
336	392	356	350	408	480	558	3,404	1,933	5,387	1.08	.68	.89	.71			

in the districts of Assam during each month of the year 1917.

APPENDIX II.

PROVINCIAL.

Statement showing details of registration in compulsory areas.

Compulsory registration area. 1	Population according to Census of 1911. 2	Estimated births at 286 per 1,000 married women between the ages of 15 and 40. 3	Number of births registered during the year. 4	Estimated birth-rate per mille. 5	Registered birth-rate per mille. 6	Number of deaths registered during the year. 7		Death-rate per mille. 8		Number of prosecutions under Act IV (B.C.) of 1873. 11	Number of convictions. 12
						Including deaths in hos- pitals. 9	Excluding deaths in hos- pitals. 10	Including deaths in hos- pitals. 11	Excluding deaths in hos- pitals. 12		
1	2	3	4	5	6	7	8	9	10	11	12
Silchar	... 8,785	296	232	33·69	26·40	171	135	19·46	15·36	20	14
Hailakandi	... 1,462	45	37	30·78	25·30	26	19	17·78	12·99	1	1
Sylhet	... 14,457	582	383	40·26	26·49	308	270	21·30	18·67	17	14
Karimganj	... 3,052	260	69	39·92	22·60	46	39	15·07	12·77	7	6
Maulvi Bazar	... 2,369	77	70	32·50	29·54	55	52	23·21	21·95	11	10
Habiganj	... 6,244	222	168	35·55	26·90	104	98	16·65	15·69	21	19
Sunamganj	... 4,620	145	126	31·38	27·27	111	103	24·02	22·29	19	19
Dhubri	... 5,808	191	178	32·83	30·64	111	82	19·11	14·11	21	18
Goalpara	... 5,964	197	189	33·03	31·69	142	130	23·80	21·79	10	9
Gauhati	... 12,481	409	391	32·77	31·32	326	256	26·11	20·51	88	68
Barpeta	... 10,739	482	488	44·88	45·44	261	259	24·30	24·11	26	10
Tezpur	... 5,355	167	175	31·18	32·67	110	76	20·54	14·19	23	20
Mangaldai	... 654	*	13	*	19·87	55	41	84·09	62·69	3	2
Nowgong	... 5,433	185	234	34·05	43·07	135	105	24·84	19·32	22	17
Sibsagar	... 5,764	213	149	36·95	25·85	92	66	15·96	11·45	8	7
Nazira	... 2,583	*	67	*	25·93	54	54	20·90	20·90	2	2
Jorhat	... 5,231	192	127	36·70	24·27	89	67	17·01	12·80	9	9
Golaghat	... 2,236	88	75	39·35	33·54	72	49	32·20	21·91	1	Nil.
Dibrugarh	... 14,563	543	384	37·28	26·36	299	174	20·53	11·94	68	49
North Lakhimpur...	... 1,645	*	56	*	34·04	55	44	33·43	26·74	...	...
Total	... 119,445	4,294	3,611	34·96	30·23	2,622	2,119	21·95	17·74	377	294

* Not available.

Resolution on the Annual Sanitary Report of the Province of Assam
for the year 1917.

Extract from the Proceedings of the Chief Commissioner of Assam in the Municipal Department, No. 4388M., dated the 15th June 1918.

READ—

The Sanitary Report for the year 1917.

R E S O L U T I O N.

Climatic conditions during the year under report were generally favourable; and the year was on the whole a healthy one. The death-rate *per mille* fell from 28·59 in the previous year to 27·09, whilst the birth-rate rose from 30·52 to 31·35. The death-rate was slightly below the quinquennial average, whilst the birth-rate, owing to the unfavourable conditions of the previous year in the Surma Valley, was lower than the average by 1·11.

2. There was no change in the agency for the collection and registration of vital statistics, but the Chief Commissioner is pleased to find that the efforts made to secure more accurate figures from tea gardens have met with success. Mr. Beatson Bell is aware of the attention paid by the tea industry to the health of its labour force, and it is hardly necessary for him to point out the importance of an accurate record of vital statistics as a preliminary to measures designed to combat disease. The low figures reported year after year in respect both of births and of deaths in certain rural circles of the Lakhimpur, Nowgong, Kamrup, and Sibsagar districts are difficult to explain except on the assumption that registration work is systematically neglected in those circles, and the special attention of the district staff will be invited to the matter.

3. The mortality reported from cholera was below, and that from "fever" somewhat above the average. Otherwise there was little variation from the normal in the number of deaths reported from the principal diseases. There was no serious epidemic of small-pox except in the district of Cachar. The Chief Commissioner endorses the Sanitary Commissioner's view that the vaccination work of that district demands serious attention. He awaits the Sanitary Commissioner's considered proposals on the subject of an increase in the staff of vaccinators employed by Local Boards.

4. The Chief Commissioner has read with interest the Sanitary Commissioner's account of the investigations which have been carried out, and of the measures which have been undertaken, with the object of stamping out the high degree of malaria infection existing at Lumding, and he trusts that the scheme will meet with the success which it deserves.

5. The total mortality from *kala-azar*, though higher than in the three previous years, was not in itself serious, but the spread of the disease to areas in Upper Assam which have hitherto been immune from it is disquieting, and received much attention during the year. Separate regulations, suited to ordinary villages and to tea gardens infected with the disease, were framed by a representative conference which met in Shillong in September 1917 and have been notified under the Epidemic Diseases Act (III of 1897). A detailed survey of the areas affected or likely to be affected has been undertaken, and arrangements have been made for the construction of an in-door hospital for the treatment of *kala-azar* patients by Sir Leonard Rogers' method. The delay which has occurred in connection with the hospital is regrettable, and the Chief Commissioner trusts that rapid progress will now be made in this most important matter.

6. The water-works project of the Tezpur, Silchar and Sylhet Municipalities have now been completed and are in working order. The water-supply of a portion of the Shillong Municipality was also supplemented during the year. The Chief Commissioner commends to the notice of the respective Municipal Commissioners the unfavourable remarks made by Major McCombie Young with reference to the sanitary work of certain municipal institutions.

7. The wells and tanks provided in the first two years' programmes of the scheme for the improvement of rural water-supply are now either completed or are approaching completion and it is most regrettable that, owing to the financial stringency imposed by the war, the Local Administration was unable to make grants to Local Boards in aid of the third year's programme.

8. The Chief Commissioner has again to express his indebtedness to Major McCombie Young for his able administration of the department, and to the President and Members of the Sanitary Board for their labours during the year.

Ordered that the Resolution and the Report be published in the *Assam Gazette*.

By order of the Chief Commissioner of Assam,

A. W. BOTHAM,

Second Secretary to the Chief Commissioner of Assam.

